JUL 24 1931

Volume XXII, No. 7 JULY, 1931

Canadian Public Health Journal

Devoted to the Practice of
PREVENTIVE MEDICINE

Radium---Its Proven Uses and Limitations in Therapy
G. E. RICHARDS

The Efficiency of Toxoid in Controlling Diphtheria
MARY A. ROSS AND NEIL E. McKINNON

Three Problems of Great Actuality
SENATOR THE HON. GUSTAVE LACASSE

How to Reduce Maternal Mortality in the Province
KENNEDY C. McILWRAITH

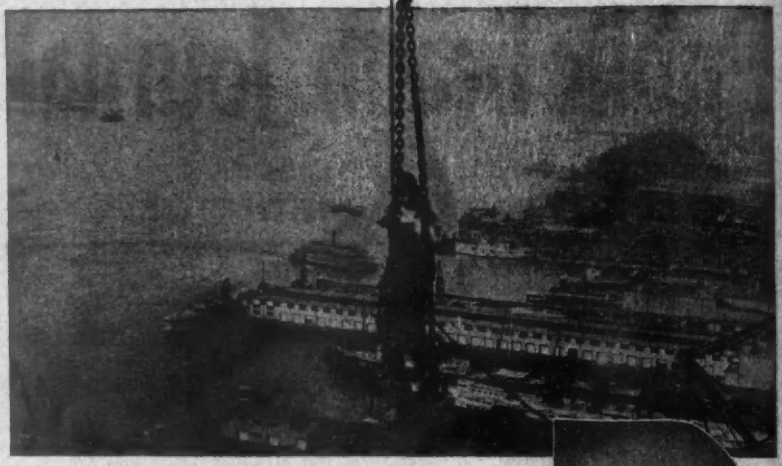
The Control of Measles and Whooping Cough
A. L. McKAY

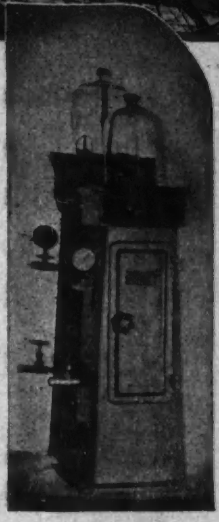
Classification of Causes of Death in a Municipal Health Department
T. E. ASHTON

Published by the
CANADIAN PUBLIC HEALTH ASSOCIATION
Editorial and Business Offices:
105 BOND STREET, TORONTO 2

Dependable Chlorination

...Vital Link in the Chain of WATER SUPPLY





"NO STRONGER than its weakest link" no water supply can risk the all important job of chlorination to inadequate control equipment. Operation records of more than 3000 W&T Vacuum type chlorinators confirm vacuum technique as the most economical and dependable method of chlorination. • Developed for this exacting service of water sterilization W&T Vacuum chlorinators are the logical selection for swimming pool disinfection, sewage treatment and allied sanitary services. • Technical Publication 38 describes these chlorinators of unbroken records. A copy is yours for the asking.

WALLACE & TIERNAN, LTD.

Manufacturers of
Chlorine and Ammonia Control Apparatus

32 Front St. West, Toronto

301 Bank of Hamilton Bldg. Winnipeg

218 New Birks Bldg. Montreal, P. Q.

"THE ONLY SAFE WATER IS A STERILIZED WATER"

8A15

CANADIAN PUBLIC HEALTH JOURNAL

VOL. XXII July, 1931 No. 7

Radium---Its Proven Uses and Limitations in Therapy

G. E. RICHARDS, M.B. (TOR.)

Associate in Radiology, University of Toronto,
Director, Department of Radiology, Toronto General Hospital

THE common conception of radium is that its use is confined to the group of malignant diseases. The patient and the laity generally fear the word because of this, and look upon it as being synonymous with the word "cancer", and while it is true that in radium we possess one of the most effective agencies in the treatment of cancer, yet it is equally true that there is a large and increasing field for radium therapy among the non-malignant diseases, in some of which it is of the greatest value while in a few it is almost a specific.

Even in its use in malignant diseases there is much misunderstanding as to the actual range of its effectiveness. In some diseases in this group it is possible to obtain results which may properly be described as a "cure"; in others, palliation only is possible. If this is correctly recognized in the beginning much misunderstanding and heart-burning may be avoided. In other branches of therapeutics it is considered part of the function of a physician to ameliorate symptoms, to prolong life, and to render to the patient as much benefit as it is within his power to do. If he fails in obtaining a permanent cure of the disease, this is not regarded as an evidence of the complete failure of that branch of therapeutics. In radium therapy this has not been recognized and quite commonly impossible things are expected of it. Pinch says: "Great symptomatic relief and prolongation of life, accompanied not infrequently by apparent cure of the condition, are seen in many cases of malignant disease, but, even though some such patients have been in good health for periods ranging from seven to thirteen years, it would be extremely unwise to predict that any, or all of them, would remain free from recurrence indefinitely."

The object, therefore, of the present presentation is an attempt to state briefly the present position of radium therapy in certain of its more important aspects, and if this attempt appears to be extremely sketchy and incomplete, the only apology which can be offered is that which time and space impose.

GENERAL CONSIDERATIONS

A more general understanding of the action of radium on living tissue would do much to simplify our knowledge of the uses of radium and the field in which benefit from its use might reasonably be expected to follow. A full discussion of this aspect of the subject is out of place at the present time but in general the more important principles may be summarized as follows:

1. Immediately following a mild dose of radium or X-Rays on living cells there is an increase in cell activity, *i.e.*, a stage of stimulation.

2. If the dose be prolonged either in intensity or time there follows a stage of arrest of cell activity. This may be described as the stage of over-stimulation.

3. If this dose also be exceeded either in time or intensity, there is a stage of degeneration and destruction of the cells.

Somewhere between the two extremes of stimulation and death of the cell, we find every effect which can be obtained by radium, and the results of treatment will depend upon a proper selection of intensity and dosage to accomplish any of these objects. In addition to the foregoing, there has to be considered the widely divergent manner in which pathological cells respond to irradiation. In general these are more easily affected than the normal tissues of the part in which they occur, and therefore they can be killed by a dose which does not destroy the healthy tissue. The margin sometimes is narrow, but nevertheless this fact determines whether or not any given tumour may be caused to disappear by radium therapy. This difference ranges all the way from the small round-celled sarcoma of soft tissue, or basal cell epithelioma, on the one hand, both of which are extremely radio-sensitive and react rapidly; to adeno-carcinoma and cylindrical types of cells on the other, which are extremely radio-resistant. In these the lethal point is so close to the lethal point of normal surrounding tissue that few cures are possible.

From the above it will be readily apparent that in any given tumour a number of possible sequences may follow upon the administration of a dose of radium.

(1) *Stimulation*—In the first place if the dose is too small, a definite stimulation is theoretically possible. This, however, is looked upon as being very controversial and with modern therapy is not of great practical importance.

(2) *Growth-restraint*—In certain regions of the body for technical reasons it is not possible to administer a fully effective dose, and under these circumstances all that can be hoped for is a series of biological results which are chiefly characterized by temporary arrest of cell activity. Thus has grown up the expression "growth restraint" in which the progress of a neoplasm may be retarded for varying periods of time and the patient's life prolonged, but the growth is not destroyed nor is the patient cured.

(3) *Destruction*—Finally, if the dose is adequate and reaches all parts of the tumour, all of the cells may be destroyed and a definite cure obtained.

These observations apply to the primary lesion but whether the disease as a whole is cured depends also upon whether or not it has extended to regional lymphatics or remote parts of the body. This question would lead us too far afield for our present discussion and is, therefore, merely referred to.

Occasionally it happens that the most radio-sensitive tumours are those which tend to migrate rapidly and widely, and thus, although the primary lesion may be completely eradicated and permanently cured, yet the metastatic problem may prove insuperable. On the other hand, an occasional tumour of which the primary is resistant and difficult to cure, tends to metastasize slowly and may for this reason be completely eradicated and thus provide a higher percentage of permanent cures.

NON-MALIGNANT CONDITIONS

From a historical standpoint it is interesting to note that one of the earliest groups of diseases for which radium was used was in naevi of the skin. In the treatment of the ordinary cavernous naevi of the skin, radium may be regarded as almost a specific. The treatment results in a gradual fibrosis of the vessels, a blanching of the purplish red colour until it ultimately fades completely away leaving an excellent cosmetic result. It is desirable to undertake treatment for this condition at as early an age as possible as very young children respond better than at a later age and there is the additional advantage of a longer time during which all evidence of disease and treatment may disappear. The treatment is best given by using comparatively light doses repeated at intervals of two or more months until the lesion has disappeared. In favourable cases there will be almost no visible scarring, while in larger and more extensive naevi, the resulting skin will be shiny and thin owing to absence of hair and glandular structures.

ANGIOMATA

Angiomata occurring beneath the skin are not suitable for surface applications of radium. In order to be effective the treatment on the surface must be either too intense or too prolonged, resulting in unnecessary scarring of the skin and a cosmetic result which is unsatisfactory. The result of implantation of radium in the form of heavily filtered radon seeds in this condition is very much superior to any other method of treatment. Here also the treatment should be undertaken gradually and under-dosing rather than over-dosing should be the rule. The primary treatment should include a thorough implantation of

radium, using weak seeds, widely spaced, about one quarter the dose being given which would be given to a similar malignant area. Following this, a long interval of time should elapse in order to allow the maximum effect from this treatment to be obtained before it is repeated. This interval we believe should be from three to six months, but by a careful use of this method, extremely satisfactory results may be obtained in the majority of cases.

MOLES

Frequent requests are made for the treatment of pigmented moles by means of radium, and this reference to the subject is made simply for the purpose of advising as strongly as we can against any such attempt. If such moles require treatment, we believe it should be done either by a wide excision, or by electro-coagulation in which the entire mole is coagulated *in situ* with a suitable margin of healthy skin. This is bound to result in considerable scarring, but is devoid of the risk of using radium alone. There is a quite definite risk of stimulating a pigmented mole by reason of the period of inflammatory reaction which follows the use of radium so that a malignant stage may be brought about.

KELOID

The frequency and variety with which keloids develop in scar tissue is astonishing, and the benefit which results from radium treatment is much greater than is commonly understood by the profession at large. The results following radium or X-Ray treatment, in fact, are so satisfactory that we believe this to be the method of choice in treatment, particularly as keloids almost invariably recur following excision, the sole result of the operation, therefore, having been to produce a larger keloid. The result of treatment by radium is rather speedier than by X-Rays but not otherwise superior, and X-Rays are advised in keloids which are present over extensive areas of the skin, such as commonly occur following extensive burns. Following such treatments the keloid becomes level with the surrounding skin, the colour fades out, the tension disappears together with the pain, leaving an area of skin which is soft, elastic, painless, and is, in fact, a normal scar.

ACTINOMYCOSIS

This is a disease regarding which we believe there is a very widespread misunderstanding. It occurs much more commonly than we have been led to believe in the past, and it also occurs over a much wider range of the population. Our own cases include a certain number of individuals who have been in contact with cattle or other animals, but a very considerable number who can give no history of any such

contact. These include lawyers, doctors, school teachers, business men, and others of similar professions, who are not associated with animals, and this fact has led in almost every case to *a long delay in establishing a correct diagnosis.*

There are few diseases apart from malignant disease itself in which an early and accurate diagnosis is of greater importance. We believe actinomycosis can be cured in the majority of cases if recognized early while it is still localized, but, if it has invaded the deeper structures, the percentage of cures is smaller, and the time element is enormously prolonged. This is the stage, however, at which the disease is usually recognized and the patient sent for treatment, and under these conditions the length of time required to obtain a cure ranges from six months to one year, whereas in the earlier stage three months is usually sufficient. If the disease has involved viscera, the percentage of cures is very small.

Treatment is administered by means of a combination of high-voltage X-Rays and radium packs on the surface and this is repeated at intervals of one to two months depending upon the extent and severity of the infection and the location of the lesions. A plea is therefore made for early accurate diagnosis and the prompt application of treatment as outlined above, this to be combined with the usual medication by means of potassium iodide.

DISEASES OF BLOOD AND BLOOD-FORMING ORGANS

Myeloid Leukemia

In the acute stage of myeloid leukemia we have seldom seen much benefit from either radium or X-Rays and have never seen a cure.

In chronic myeloid leukemia, however, the results following the use of radium are frequently spectacular. The white count falls rapidly and may be brought down to normal, occasionally falling below normal. A moderate leukopenia has not resulted harmfully, and is not, therefore, considered alarming nor a contraindication to further treatment.

For this disease radium is used externally over the spleen, while X-Ray therapy is commonly administered to the marrow-forming bones. It is considered important to obtain the maximum regression in the size of the spleen in the shortest possible time, since repeated applications of radium or X-Rays over the spleen are frequently followed by interstitial fibrosis, and it is important to obtain the greatest degree of reduction before any such fibrosis can occur. Therefore, the treatment is pushed aggressively until the spleen is reduced to its normal size and the blood count to normal, or as nearly so as possible. Following this it is considered of the greatest possible importance that frequent blood examinations be made and carefully charted. If the white count rises above fifteen thousand, treatment should be repeated, the dose being

carefully estimated as being sufficient for the purpose, but not, of course, as intensive as the original treatment. A good routine consists in having blood examinations every two weeks. This will give ample warning of any impending rise in the white count and enable treatment to be undertaken in sufficient time. At this stage of the disease X-Rays may frequently be substituted for radium, and in a few cases in our own experience X-Rays have proved superior at this stage to further applications of radium. By a judicious combination of either one or other of these agents the patient may be kept alive and well for long periods of time, although it is probable that none of these patients are ever permanently cured. The average extension of life is difficult to decide with certainty; from three to six years is not uncommon.

Lymphoid Leukemia

Lymphatic leukemia appears to be considerably more uncommon than the myeloid type, and also presents itself in acute and chronic stages. As in the myeloid type we have seen little benefit from radium in the acute stage of this disease. The majority of the acute cases have been young adults, frequently from sixteen to twenty-five years of age, and the disease has followed a rapidly fatal course regardless of treatment, whether by radium or otherwise.

The chronic type, however, is one in which much benefit frequently follows X-Ray and radium treatment. The glandular swellings diminish and ultimately disappear, the total white count diminishes, and there is a re-arrangement of the individual cells so that the normal balance is approximated. In some cases almost a normal count has been obtained. Associated with the change in the blood picture, there is a corresponding improvement in the patient's general condition so that in favourable cases a normal life may be followed. The period of improvement lasts for a variable time, which may range from one to several years. Sooner or later, in the majority of cases, a recurrence takes place and further treatment will be necessary, and as in the myeloid type, it is probable that few, if any, of these patients can be regarded as cured. The intervals between active periods of the disease become shorter and the response to treatment less until finally the disease terminates fatally. There seems no doubt that radium very definitely affects the disease in a favourable manner; the symptoms are controlled for varying periods of time, but this disease illustrates one of the definite limitations of radium in so far as cure may be concerned.

Splenomegaly and Banti's Disease

In the former of these diseases the results of treatment are based upon the size of the spleen and frequently are of sufficient importance to justify its use. As in myeloid leukemia the size of the spleen greatly diminishes and it may become practically normal. In Banti's disease

this has not been so constant nor is there a corresponding improvement in the clinical condition of the patient. We believe the treatment is justifiable as a therapeutic test in either of these diseases, but, if no marked benefit is obtained, it should not be persisted in.

HYPERTHYROIDISM

Hyperthyroidism is a disease in which treatment by X-Rays and radium has not received the degree of acceptance by the profession at large which the results warrant. We shall limit our present comments to a more or less dogmatic statement which we believe to be a fair and accurate statement of what may reasonably be expected from this method of treatment.

The most suitable type of case for treatment is the pure exophthalmic goitre or thyroid toxicity without adenoma. The percentage of clinical cures in this group is between 70 and 80 per cent. By this is meant such a degree of improvement that the patient is able to return to his or her normal life with a pulse rate which is normal, a basal metabolic rate which is practically normal (there are exceptions to this which we believe to be comparatively insignificant), an increase in weight, a disappearance of nervous symptoms and tremor, and a general condition which may accurately be described as a clinical cure. There still remains a percentage of cases varying from 20 to 25 per cent in which the improvement is either so slight as to be negligible, or is not sufficient to be regarded as satisfactory, and this percentage is accepted as indicating one of the limitations of the method. We believe these results compare not unfavourably with the average of surgical methods of treatment.

The disadvantage of the method is that it is slower in obtaining results than a successful operation, the total time required averaging about four months before marked improvement has been fully obtained. The advantage is that it is relatively safe and carries no death rate.

TOXIC ADENOMA

In this condition the result of treatment will usually be a reduction of the toxicity with slight effect upon the adenoma and in some cases no reduction of the latter, *i.e.*, the patient is cured of his toxicity but left with his adenoma, and it is in this group that the greatest number of failures have occurred by reason of efforts to accomplish the impossible.

SIMPLE ADENOMA AND CYSTIC GOITRES

Simple adenomata and cystic goitres are unsuitable for X-Rays and radium and in these no benefit should be expected.

MENORRHAGIA

Disturbances of the menstrual function occurring from puberty up to the menopause, present a problem in which radium and X-Ray therapy provide an extremely useful therapeutic adjunct. Time permits merely to say that in this condition in younger women, X-Ray therapy may frequently be sufficient to restore a normal balance; occasionally radium will be necessary, but in both, considerable judgment and experience will be necessary. At the time of the menopause the group of changes which are known under the name of "fibrosis uteri" or "benign bleeding" provide a field in which radium is indeed specific. Under modern conditions no woman need be allowed to become profoundly anaemic or an invalid from this source of bleeding, and we believe it is a reflection on the medical profession if this be allowed to occur. A single application of radium within the uterus, correctly measured, having regard to the patient's age and the type of bleeding present, will control the bleeding with practically absolute certainty. This may range by a careful selection of dosage all the way from the restoration of a normal menstrual function to the establishment of a complete menopause. The results are among the most satisfactory in therapeutics.

UTERINE FIBROIDS

In cases of fibroids two problems arise,—first, bleeding, if it is present; and second, the tumour itself. The bleeding may be controlled in the majority of cases by a similar method to that used in fibrosis uteri. If the fibroid is not larger than a grape-fruit or thereabouts, it will probably completely disappear by an application of radium within the uterus and thus in such a case both problems would be solved. If the fibroid is larger than a grape-fruit, it is quite commonly beyond the range of radium and the use of radium under these conditions will frequently be followed by failure to obtain a completely satisfactory result. Fibroids of larger size, however, are not beyond effective treatment by high-voltage X-Rays, and in that group much benefit may be obtained by this method of treatment.

A contraindication in all cases is the presence of latent infection within the pelvis. Probably sub-mucous and pedunculated sub-serous fibroids should also be regarded as practical contraindications and treatment be undertaken only under exceptional circumstances.

The subject is so large and complex that one is referred to the numerous detailed works on the subject for further information.

(To be concluded in the August issue.)

The Efficiency of Toxoid in Controlling Diphtheria

TORONTO, 1926-30

MARY A. ROSS, M.A., AND NEIL E. McKINNON, M.B.

Department of Epidemiology and Biometrics
University of Toronto

IN a previous communication[2] the amount of diphtheria that would have occurred in the absence of an immunization campaign, in the 36,189 school children who had skin tests done or were given toxoid, was estimated by applying to those children the rates in the control group, the remaining two-thirds of the school population, corrected for the differences in age and monthly distribution. The amount of diphtheria that would have occurred in the children given one, two or three doses of toxoid, however, cannot be estimated so readily on account of the fact that certain children of a lesser susceptibility than that of the whole were removed from those given toxoid. The latter, as a group, are thus more susceptible and should give proportionately higher rates than the whole group. To estimate the diphtheria that might have been expected in these children in absence of immunization, therefore, certain corrections must be made in the preliminary figures obtained by applying the rates in the controls, adjusted for age and monthly distribution. In order to avoid confusion the preliminary figures, obtained by applying the control rates, are omitted.

In the 36,189 children there are four groups, (1) a sample, 5,648* of Schick-negative children who were not given toxoid, (2) 3,267 3+ reactors to the reaction test** who were not given toxoid, (3) 407 children who were neither Schick-negatives nor 3+ reactors but who were not given toxoid, and, (4) the 27,209 children who were given toxoid, one, two or three doses,—a group from which all 3+ reactors and a portion of the Schick-negatives had been excluded. The control children (approximately 60,000) can be grouped into (1) Schick-negatives (estimated), who would be expected to give diphtheria at the same rate as obtained in the known Schick-negatives, (2) 3+ reactors who, similarly, would be expected to give the same rate of diphtheria as obtained in the known 3+ reactors, and (3) "the remainder"; "the remainder" = "All − Schick-negatives − 3+ reactors". From the rates

**This includes 342 children who were also 3+ reactors and are included, too, in that group.*

***Individuals who show definite induration at the site of injection of the reaction test, diluted toxoid, used either alone or as a control in the Schick test.*

of diphtheria in the Schick-negatives and in the 3+ reactors, the percentage these rates are of the rate in "All", and the proportion each of these groups forms of the whole, the cases and rate of diphtheria in the "remainder" can be estimated.

The 3+ reactors are considered first. Table I shows the cases that actually occurred in this group, and the cases that would have been expected, if the rates, in all the control children, corrected for age and monthly distribution had prevailed in the 3+ reactors. Comparison,

TABLE I

DIPHTHERIA IN 3+ REACTORS

Period	Actual Cases	Estimated Cases at Rate* in Controls	Ratio % of Actual: Estimated
1926-27	0	2	
1927-28	2	6	33%
1928-29	2	9	22%
1929-30	1	9	11%
Dec. 1926-Aug. 1930	5	26	19%

*Corrected for Age and Monthly Distribution.

therefore, of the number of cases thus estimated and the actual cases shows the relative liability to diphtheria of the 3+ reactors compared to the general school population. In the year 1927-28 the rate of diphtheria in 3+ reactors, corrected for age and monthly distribution, was 33 per cent of the rate in the normal school population as shown by two-thirds of that body; 22 per cent in 1928-29; 11 per cent in 1929-30, and 19 per cent in the whole period December, 1926, to August, 1930. The number of 3+ reactors studied is too small to allow such a comparison in single year age groups; consequently the comparison of the age group of 5 to 14, as a whole, must be used for single year age groups. The data for the year 1926-27 are insufficient to allow a fair comparison for that period.

The percentage of 3+ reactors, at the various ages, as found in 18,532 children tested, is shown in Table II. These percentages are assumed, fairly, to be representative of the 3+ reactors in the whole school population. The proportional rate of diphtheria in a group of children from which the 3+ reactors are excluded, compared to the rate in "All", can be readily calculated as shown by the following example:

Let 10,000 represent a group of children, 10 per cent of which are 3+ reactors in whom the rate of diphtheria is, let it be supposed, 25 per cent of the rate in all.

Let 100 represent the diphtheria in the whole group of children.

Then 10,000 yield 100 diphtheria, a rate of 100 per 10,000.

3+ reactors = 10/100 of 10,000 = 1,000.

$\therefore$ 9,000 "others" + 1,000 3+ reactors yield 100 diphtheria.

If the 1,000 3+ reactors are excluded from the exposed group, the group is thereby reduced to 9,000.

If the 1,000 3+ reactors yield diphtheria at the same rate as the whole 10,000, they would give 10 per cent of the diphtheria. But the rate of diphtheria in 3+ reactors is (supposed) 25 per cent of rate in all. Therefore, the 1,000 3+ reactors yield only 25/100 of 10 per cent = 2.5 per cent.

$\therefore$ 9,000 "others" yield $100 - 2.5 = 97.5$ diphtheria.

$\therefore$ The rate in "others" $= \frac{97.5}{9{,}000} \times 10{,}000 = 108$ per 10,000.

In other words the rate in "All − 3+ reactors" is, in this example, 108 per cent of the rate in "All".

TABLE II

3+ REACTORS AND SCHICK-NEGATIVES* IN SCHOOL CHILDREN
TORONTO, 1926-1927

Ages	Children Tested	3+ Reactors		Schick-Negatives	
		No.	%	No.	%
5.....	175	2	1	62	36
6.....	1641	46	3	439	27
7.....	1935	96	5	536	28
8.....	2224	130	6	762	34
9.....	2280	198	9	795	35
10.....	2433	270	11	824	34
11.....	2423	313	13	860	36
12.....	2380	357	15	862	36
13.....	1911	319	17	681	36
14.....	1130	197	17	438	39
5-14.....	18532	1928	10	6259	34

*Further data will be given in a subsequent communication to which reference should be made before making any comparison with similar data from other sources.

In this manner the additional cases of diphtheria, by single years of age, in children from whom the 3+ reactors have been excluded, have been calculated for the period of observation and are shown in Column A, Table V, in summary. The data relative to the respective years have been used for making the corrections for 1927-28, 1928-29 and 1929-30; for 1926-27, owing to the paucity of data for that period, the average, 19 per cent, as shown previously, was used.

The children who received toxoid are, however, not strictly comparable to a group of children with 3+ reactors excluded, as other children of lesser susceptibility, Schick-negatives, were also excluded from them. The additional exclusion of Schick-negatives leaves the "remainder" a still more susceptible group than the exclusion of 3+ reactors only. The "remainder", *i.e.*, "All − 3+ reactors − Schick-negatives", should show, therefore, a higher rate than "All − 3+ reactors". Correction for the exclusion of Schick-negatives, sufficiently accurate for the purpose, can be made by estimating the difference

between the rates in "All−3+ reactors" and in "All−3+ reactors−Schick-negatives".

The following shows such a calculation, similar in every way to the previous one for the exclusion of 3+ reactors:

Let 10,000=all the children and 100=all the diphtheria given by the whole group.

Then the rate=100 per 10,000.

Let there be 10% 3+ reactors and 25% Schick-negatives.

Let the rate in 3+ reactors be 25% and the rate in Schick-negatives be 10% of the rate in "All".

Then the "remainder" after exclusion of 3+ reactors and Schick-negatives will be 10,000−10%−25%=6,500 and the amount of diphtheria given by this "remainder" will be

100−25% of 10−10% of 25=95 diphtheria

i.e., 6,500 "remainder', yield 95 diphtheria

∴ The rate in "All−3+ reactors−Schick-negatives" is

$$\frac{95}{6{,}500} \times 10{,}000 = 146 \text{ per } 10{,}000, \text{ or } 146 \text{ per cent of the rate in "All".}$$

This factor, 146, in "All−3+ reactors−Schick-negatives", is 135 per cent of the rate in "All−3+ reactors", 108, as previously calculated. The cases in such a group would accordingly be increased in number by 35 per cent if the numbers used in the example were applicable.

If the Schick-negatives had been excluded throughout the campaign such a correction could be added to the whole estimated number of

TABLE III

CHILD MONTHS OF ALL CHILDREN GIVEN TOXOID AND OF CHILDREN GIVEN TOXOID AFTER EXCLUSION OF SCHICK-NEGATIVES

1	2	3	4	5
Period	Number of doses	Total child months of all children given toxoid	Child months of children given toxoid after exclusion of Schick-negatives	Ratio % of Column 4: Column 3
1926-27	1	2984	2205	74%
1927-28	1	10209	5410	53%
1928-29	1	13526	4680	35%
1929-30	1	13716	4020	29%
1926-27	2	32587	25646	79%
1927-28	2	87915	62340	71%
1928-29	2	90107	55140	61%
1929-30	2	85572	47136	55%
1927-28	3	69128	8120	12%
1928-29	3	169249	8748	5%
1929-30	3	178416	8148	5%

cases. However, Schick-negatives were excluded only in part even early in the campaign, after which time, even if identified, they were given toxoid. The children from whom the Schick-negatives were excluded before the remainder were given toxoid were then carried under observation as part of their respective groups of "one", "two" or "three dose children", the later increment in each group being composed of children from whom the Schick-negatives were not excluded. The percentage which the child months of children given toxoid, who had Schick-negatives excluded, form of the total child months of all children given toxoid in each year, has been calculated, as shown in Table III, and with this the increase in the number of expected cases can be estimated. As will be seen in Table IV, however, approximately 6 per cent of Schick-negatives are 3+ reactors. Allow-

TABLE IV

3+ REACTORS IN 6259 SCHICK-NEGATIVES

Age	Schick-Negatives	3+ Reactors in Schick-Negatives	
		Number	Per Cent
5	62	0	0
6	439	16	4
7	536	16	3
8	762	25	4
9	795	38	5
10	824	52	6
11	860	66	8
12	862	57	7
13	681	47	7
14	438	33	7
5-14	6259	350	6%

ance has already been made, therefore, for the exclusion of 6 per cent of the Schick-negatives by the correction for 3+ reactors. The additional correction is to be made, therefore, for only 94 per cent of the percentages shown in Table III, column 5. The additional cases are shown in Table V, Column B.

As the test of the accuracy of the estimations in this communication will be made by comparison of the total number estimated in the various groups with the number estimated in reference[2] for the group as a whole, it is necessary that the period of observation for the two estimates be the same. The observations in the first estimate, for the group as a whole, extended from the first entry of the pupil for test or first dose of toxoid. The observations for the second estimate, up to this stage, for the children given toxoid, commenced with the date of the last dose of toxoid received and by which the pupil was accordingly classified. Children who received two doses of toxoid had

thus been under additional observation in the first estimate, for a three week period between the first and second doses. To make the estimates comparable, therefore, the observation of children during that period of immunization should be included in the observations on "1 dose children". Similarly children who received finally three doses of toxoid and were thus classified as "3 dose children", had passed through two periods of three weeks each, one period as "1 dose" and one as "2 dose children" and the child months of these groups should be increased accordingly. Correction for this period, sufficiently

TABLE V

CORRECTIONS FOR VARIOUS FACTORS IN ESTIMATED CASES OF DIPHTHERIA IN CHILDREN GIVEN TOXOID

Period	Cases Added in Children Given								
	1 Dose			2 Dose			3 Dose		
	A*	B*	C*	A*	B*	C*	A*	B*	C*
1926-27.....	<1	<1	4	1	7	–	–	–	–
1927-28.....	<1	1	4	3	12	4	2	1	–
1928-29.....	<1	1	1	3	8	2	5	1	–
1929-30.....	<1	2	0	3	14	0	7	3	–
1926-30.....	–	4	9	10	41	6	14	5	–

*A—Correction for exclusion of 3+ reactors.

*B—Correction for exclusion of Schick-negatives.

*C—Correction for the period which children given 3 doses were under observation as "1 dose" and "2 dose children" and children given 2 doses were under observation as "1 dose children".

accurate for the purpose, is readily made by computing the extra child months in each year for the "1 dose" and "2 dose children" and estimating, *pro rata*, the additional cases. The child months are obtained by multiplying the number receiving two and three doses in each year by the 3 week, or 0.7 month, period. In making the *pro rata* estimate of additional cases the constitution of the "2 dose" and "3 dose children" in regard to content of Schick-negatives has been taken into consideration. The cases which have been added in this estimate by this correction, are shown in Table V, Column C.

Table VI shows the number of cases thus estimated to occur in the three groups of children given one, two and three doses of toxoid in the various years, when all corrections referred to have been made. It shows, in other words, the number of cases estimated to occur in each group of children given toxoid, by applying to them the rates that obtained in the same months, in children of similar susceptibility and

exposure who were not given toxoid. The total number of expected cases is 456. The table also shows the actual number of cases that did occur in each group in each year and the estimated reduction. As the three dose treatment is the one recommended and used in Canada little need be said of the results with one and two doses.

The inadequacy of one dose is evident. In the 24 cases that did occur in the "1 dose children" there were two deaths, one within ten days after receiving the toxoid. The necessity for a third dose is shown by comparing the results in the "2 dose" and "3 dose children". In the 52 cases in the "2 dose children" there were two deaths. Existing case fatality rates in this number of cases would give an expectancy of three to four deaths.

TABLE VI

REDUCTION IN DIPHTHERIA IN CHILDREN GIVEN TOXOID
TORONTO, 1926-1930

Period	3 Dose			2 Dose			1 Dose	
	Estimated Cases	Actual Cases	Reduction per cent	Estimated Cases	Actual Cases	Reduction per cent	Estimated Cases	Actual Cases
1926-27				24	7	71	6	7
1927-28	25	1	96	58	10	83	10	8
1928-29	84	7	92	52	16	69	9	6
1929-30	113	15	87	66	19	71	9	3
1926-30	222	23	90	200	52	74	34	24

Total Estimated = 456

In 16,829 children given three doses of toxoid in Toronto schools it is estimated that 222 cases of diphtheria would have occurred in the absence of immunization. The actual cases were 23, one of which occurred within 2 months of receiving the last dose. This is a reduction of approximately 90 per cent. No deaths occurred in these children. At the existing case fatality rates one or two deaths might have been expected in the 23 cases. As stated, there were none. The expected number is too small to form a sound basis for conclusions but it is suggested that even where diphtheria did occur it was met by a resistance enhanced to such a degree that death was prevented, or that some, at least, of the cases reported as occurring in the "3 dose children" were not diphtheria. This reduction in diphtheria was accomplished by the judicious use of the reaction test, without producing one reaction of any significant degree.

The Accuracy of this Estimate

The accuracy of this estimate may be tested by comparing it with the number estimated directly by applying the rates in the controls to the whole group of 36,189 children as calculated previously[2].

As the 36,189 children contain the 8,573 Schick-negative or 3+ reactors who were not given toxoid and in whom 22 cases occurred, this number of cases must, for comparison with those receiving toxoid, be subtracted from the number estimated to occur in the whole group. The number estimated by applying the rates in controls to the whole 36,189 was 478. Subtracting the 22 occurring in the Schick-negatives and 3+ reactors leaves 456 to occur in the remainder. This remainder contains also, however, 407 children who were not given toxoid though they did not show either a negative reaction to the Schick test or a 3+ reaction to the reaction test. The number of cases estimated to occur in this small group must also be subtracted from the number estimated for the whole group. The observations on these 407 amount to 6,877 child months or 0.65 per cent of the total child months of the whole group. At the most, therefore, this small group might yield that percentage of the total cases, *i.e.*, 3. As these 407 were mostly of older age groups the probability is that the number would be smaller. When this number, 3, is subtracted from 456, the number of estimated cases fairly attributed to the children given toxoid, is 453. This number is in practically complete agreement with the total number estimated separately in the groups given 1, 2 and 3 doses of toxoid, when susceptibility was also considered, and the accuracy of the latter estimates is thus confirmed. This close agreement is to some extent due to chance. It was neither required nor expected through the character of the calculations made.

In spite of the fact that the relative accuracy of the number of cases estimated to occur, in the absence of immunization, in the various groups of children receiving toxoid, is thus established, objection may be raised to using correction factors varying so much from year to year, although based on the rates in Schick-negatives and 3+ reactors as actually observed in the respective years. It may be argued that averages of the whole period of the rates in Schick-negatives and 3+ reactors should be used in making the respective corrections. As what actually did occur has been made the basis of the study throughout, averages have been avoided. When the averages are used, however, the total estimated number of cases is increased by 4, an insignificant difference from that found by using the rates for the respective years.

The relatively small variations in the estimated efficiency of 3 doses of toxoid in the various years is in keeping with what might be expected. These variations are not influenced to any significant degree when the averages are used for correction as suggested in this discussion—and are noticeably less than the variations observed in the Schick-negatives and 3+ reactor groups. There is little variation even in those given two doses of toxoid.

Similarly, as might be expected, there is evident a stepping-up in efficiency from one to three doses. The marked effect of the secondary stimulus is strikingly demonstrated by comparing the results in those given one and two doses. Finally, the efficiency which has been estimated in this study is in very close agreement with the percentages showing 1/25 unit or more antitoxin content of blood after two and three doses of toxoid as found by actual antitoxin titrations for smaller groups by Moloney and Fraser[3], [4].

Among the control children there was undoubtedly a small unknown number of children given toxoid by the family physicians. Their exclusion would give higher rates in the controls. This correction, however, could not be made but would be insignificant.

It is altogether probable that with improvements in the quality of toxoid, which have been instituted in the past two years, even greater efficiency will be attained. The present toxoid is made from much more potent toxin, has higher flocculating value, and judging from evidence in experimental animals, definitely higher immunizing value.

Summary

The reported cases of diphtheria that occurred subsequent to toxoid immunization of school children in Toronto are compared with the cases which it is estimated would have occurred in the absence of immunization. In 16,829 children given 3 doses of toxoid and observed from 1 to 3 years, the number of cases estimated to occur is 222. The actual cases were 23. This is a reduction of approximately 90 per cent. No deaths occurred in these 23 cases. This 90 per cent reduction in cases with elimination of deaths in this group of children was accomplished without producing one reaction of any significant degree, possible reactors, forming 10 per cent of the school children, being excluded by judicious use of the reaction test.

We would express our gratitude to Doctor J. G. FitzGerald, Director of the School of Hygiene, for providing every facility for making this study and to Doctor R. D. Defries, Professor of Epidemiology and Biometrics in the School of Hygiene, for his unfailing interest and advice.

REFERENCES

[1]The administrative control of the diphtheria toxoid campaign in Toronto, 1930, F. S. Burke. *Canad. Pub. Health J.*, Vol. XXI, No. 5, pp. 209-218, May, 1930.

[2]Reduction in diphtheria in 36,000 Toronto school children as a result of an immunization campaign. 1931, N. E. McKinnon, M. A. Ross and R. D. Defries. *Canad. Pub. Health J.*, Vol. XXII, No. 5, pp. 217-223, May, 1931.

[3]Immunization with diphtheria toxoid (Anatoxine Ramon). P. J. Moloney and C. J. Fraser. *Am. J. Pub. Health*, Vol. XVII, No. 10, pp. 1027-1030, October, 1927.

[4]P. J. Moloney, 1931—Personal communication.

Erratum—In the previous communication, Ref.[2], in table III, p. 222, the estimated reduction in cases in the whole group is shown to be 338. *As is apparent in the table, the number should read* 358.

Three Problems of Great Actuality*

SENATOR THE HON. GUSTAVE LACASSE, M.D.

IT is my privilege to-day to welcome you all, fellow-members of the Ontario Medical Officers of Health and associate workers, who have been gathering annually ever since the founding of this Association sixteen years ago. Personally, I do not believe that I have missed one convention, and I feel satisfied that every time, when the last item on the programme had been dealt with, each of us left for our respective district with more knowledge, a greater consciousness of our responsibilities, and an increased courage and enthusiasm in the discharge of our many duties. The programme of study prepared for this meeting of 1931 is, as usual, most interesting, and I have no doubt but that again every one of us will derive a great benefit from these deliberations.

I said a moment ago that I could not recollect having failed, even once, to appear at these annual conventions, but some familiar and sympathetic faces were missed each year, and it is our sad duty to note their passing. May I pause for a moment to pay the humble tribute of my respect to the memory of those who are no longer with us, and of whose valuable experience and warm friendship we shall, from now on, be deprived. I have one in mind whose absence we feel particularly. He was the grand old man of Ontario in the field of public health activities. He was a pioneer, and he was a master. His timely contributions to our programmes were most inspiring and instructive. No man in the performance of his daily duties as medical officer of health was ever more efficient or more devoted to the public, and it is not saying too much to declare that our departed colleague established a tradition which any public servant in the future would do well to preserve and to live up to. His name was Charles J. O. Hastings.

Now, before entering upon the main subject of my discourse, I wish also to pay my compliments to a newcomer in our midst, and to extend to the new head of the Department of Health in Ontario—the Honourable Dr. J. A. Robb—on my behalf, and on behalf of all the members of this Association, my cordial greetings and my most sincere wishes for success in his present duties. May I add that I feel confident that, with the able assistance of his deputy-minister, and the other members of his departmental staff, he will so well rid this fair Province of all bugs and bacteria that all communicable and infectious diseases will be a thing of the past, and that most of us, before long, will have, henceforth, to concentrate on preventive medicine through periodical physical examinations, and through the detection of organic pathological conditions exclusively, to make our living.

May I now just touch briefly upon three problems to which present conditions give an exceptional importance, and which, to my mind, are closely co-related; These are, Care of Indigents; Health Units; State Medicine.

**Presidential Address presented at the 17th Annual Meeting of the Ontario Health Officers' Association, Hart House Theatre, University of Toronto, Toronto, May 20th, 21st and 22nd, 1931.*

Care of Indigents

As I have said on many occasions, among all social enterprises two principal ones stand out as more and more expensive, and yet more and more indispensable—education and charity. No department of public instruction anywhere ever contributed one penny to the public treasury, and no hospital patrons ever drew any dividends at the end of their fiscal year. The business depression which is submerging the whole world at present is not respecting our own land any more than others, and the main problem of our Ontario municipalities is no longer fire protection, drainage, local improvements, or any other such undertaking; it is, almost everywhere, public charity. Let us for a few minutes study that question, inasmuch as it is closely connected with medical assistance, especially from the point of view of the medical officer of health.

I thoroughly agree with the Honourable L. A. David, Provincial Secretary and Acting Minister of Health for Quebec, who, when addressing the Medical Board and the Staff of a School of Applied Social Hygiene in Montreal a few days ago, said:

"This School is doing more than you might realize to solve many a social problem. In periods of hard times consideration shown to the poor and the needy, sound advice and help given to those who suffer, can do more to solve complex domestic problems than any elaborate theory. . . ."

Nevertheless, I believe we should, in fairness to the ratepayers who are already overburdened by taxation, use some system of fair discrimination in rendering medical assistance to the indigents.

The "Detroit Free Press", in a very well-written editorial, published in its issue of April 7th of this year, quotes a Japanese journalist, diplomat and author, Yusuke Tsurmi, who sums up in his colourful way one aspect of the human philosophy of the descendants of the "Rising Sun":

"The members of a family take care of one another in Japan, and, if two in a family of seven are thrown out of work, the other five consider it their obligation to attend to the two who are unemployed. There is a national pride about the matter."

The American paper goes on and blames the gradual disruption of the home and the utter "lack of natural affection, honour and innate decency" which were, a generation ago, the best safeguards of family ties and reciprocal responsibility, for the conditions that now prevail and oblige county poor commissions, or "Welfare Departments", as they are daintily called to-day, to keep perpetually on the watch. May we interject here, that what applies to unemployment applies also to poverty and sickness:—"To-day", concludes the "Free Press", "heathen Japan looks at the domestic life and relationships of much of America, and holds its nose. It has a right to."

Now, must we not admit in all fairness that, although on a smaller scale, the same lack of a sense of family responsibility, the same self-interest and self-indulgence, the same eager desire "to shove the old

folks, or other incumbrances aside" have gradually permeated a part of our own population. Our problem is thereby becoming much more complicated.

May I be permitted, here, to add that the medical profession at large has itself to blame also for the existence of such acute conditions in certain instances. Too many doctors, for the sake of personal popularity, or through misunderstood generosity, neglect to collect their legitimate earnings. They may be praised a great deal for so doing, and called most charitable men, but I do say that no father of a family at present can feed his children on a diet of pretty words and saintly glory. Furthermore, the medical man who is too lenient along the line suggested above—and here is the main point insofar as this study is concerned—is unfair, not only to himself, but to his confrères and to the public at large, because the people he spoils sooner or later will become public charges on the community.

I hasten to make a reservation here and say that all physicians must be charitable to a very large extent, but the point I am trying to make is that they must dispense charity in a very judicious and discreet manner, because too many people have been exploiting the profession regularly, and some step must be taken to do away with this evil. In the long run, it is in the interest of the public itself, for the public pays for the establishment and maintenance of all charitable institutions.

The Public Health Act states . . . unspecifically that the medical officers of health may take care of the sick who cannot afford to pay for medical attention, through an agreement with the municipality interested. That is all well and good, but, as it stands, most reeves and councillors are under the impression that the care of indigents is one of the essential duties of the medical officers of health. I believe the Act should be made, if not clearer, at least more explicit on this point. At all events, I bank my hope on the early organization of regional health units as a general remedy for that awkward situation.

Heatlh Units

With reference to the institution of a new system of health units throughout the Province, I do not wish to repeat at length what I said once before on a very similar occasion. I am sold on the principle of it. The scheme has been tried elsewhere and worked out most satisfactorily. Aside from the fact that it would create more uniformity, a better co-operation within, and between, neighbouring municipalities, and, consequently, a greater efficiency in our fight against the spread of communicable diseases, etc., I submit that the point I have just developed, as regards medical care of indigents, adds a new and powerful argument to the case. Would not the expenses of caring for institutional patients, or home cases, in effect, be more evenly distributed, and, therefore, more easily borne, if, through a system of

well-apportioned areas, better equipped staffs, better trained men, full-time officers directly responsible to the Department, more free from local semi-official interference, all efforts were co-ordinated financially and scientifically?

I feel quite at ease in making these declarations, because the Honourable the Provincial Minister of Health, has already committed himself in this direction. I was pleased to read in the press the report of a speech he delivered before the Middlesex Trustees and Ratepayers Association, at London. The Minister then and there publicly advocated the formation of county health units.

May I offer a personal suggestion to this Assembly, which is vitally interested in this aspect of the problem. As the transition from our present system to the proposed re-organization may entail quite a little difficulty, and, as one of the direct results would be the turning out in the cold of a large number of faithful medical officers of health who have discharged their duties with devotion and intelligence for many years, I suggest that they may be considered by the Department as a group of preferred candidates for the positions thereby created, according to the rule of seniority. Their valuable experience in the administration of the Public Health Act in the course of their many years of service would be quite an asset from the start, and besides, such a policy would be an act of justice and due recognition.

State Medicine

Much has been said recently about State Medicine. University professors, undergraduates, medical societies, and even members of parliament have given a great deal of attention to this problem. One might ask what relation that question may have to the trend of this address? Simply this. There is in everything the danger of "overdoing it", of abusing a good thing, and such is the case at this very time. We are facing the danger of "over-systematizing" the medical practice. In other words, we are invited to administer to ourselves an overdose of Socialism as applied to professional activities.

Would I surprise anyone if I said that we are already applying the principles of state Socialism to many departments of public administration. I am not deliberately opposed to that, but I do say that we have gone far enough for the time being. A hasty adoption of any system of State Medicine would be fraught with perils. Let us take the time to study all the aspects of it. Let us gather more data and investigate in the few countries which have put it to a test before venturing into a scheme which would be a radical departure from what we are used to so far. I think the Parliament of Canada took a sensible attitude in referring it to a committee for further study.

Well do I realize that in some cases the very activities of this Department of Health, through its free clinics and other initiatives,

are considered already, wrongly or rightly so, as interfering with the general practice of medicine, by creating at times almost unavoidable friction with the profession and provoking the protests of private practitioners, notwithstanding the earnest good-will of all concerned. What would it be if, without a process of long preparation, we were thrown into the melting pot, so to say, where "just the fittest survived".

"Physicians must not be debased to the position of salaried employees of the state, of insurance companies, or of commercial organizations. That way lies the destruction of individual initiative, the lessening of responsibility, the lowering of standards, and the reduction of a great profession to 'the cellars of oblivion'," says the Chief Editor of an important health magazine, and I thoroughly endorse his views in this matter. At any rate, should it be decided at some future date to establish some form of State Medicine in Canada, I claim that it should be left, through some optical scheme, to the discretion of the respective provinces, at least in the initial stage of the experiment.

It is impossible, of course, to do justice to a problem of such magnitude in an address of this kind. I just wish to voice a cautious warning against any hasty move, as I said before, towards too radical a departure from the ancient order of things.

Before concluding, Ladies and Gentlemen, I have one more duty to perform, and a very pleasant one indeed. I wish to convey my deep gratitude to this body of medical men who have been so good as to bestow upon my humble person the greatest honour in their gift in electing me as their President. Once more it has been proven that difference in nationality, difference in language, difference in education and professional training, means nothing to the broad-minded, English-speaking Canadians. Although not a graduate of the great universities of Ontario, although not a son of the race in the majority in this Province, I have had the distinction of being chosen to lead your Association for one term. Again, in my own name, and in that of m y fellow-compatriots, I thank you from the bottom of my heart for your generous gesture. Let that attitude of yours be a concrete example to the firebrands whose ill-inspired endeavours, here and there, tend to create a chasm between the two pioneer races of this great Canada of ours. You have understood that all citizens worthy of the name of Canadians, irrespective of their creed, racial origin or language, political or lodge affiliations, must, and particularly so at this time of general crisis, work hand in hand for the constant upbuilding of their common country, in order to live in mutual harmony, social peace, and healthy contentment in the land of their fathers and sons, in the land of past glories and future achievements.

How to Reduce Maternal Mortality in the Province*

KENNEDY C. McILWRAITH, M.B.†

Associate Professor of Obstetrics, University of Toronto
Senior Obstetrician to the Burnside Lying-in Hospital

TOO harsh a judgment should not be pronounced when unfavourable comparisons are made between our statistics and those of European countries. Each of these older civilizations deals chiefly with a single race, living in its accustomed environment, while we deal with all races of the earth striving to live and reproduce in alien climate and circumstances. For example a Bulgarian physician in Toronto sent to us a compatriot suffering from the pernicious vomiting of pregnancy. We have had 3 or 4 of this race in recently for this complaint, though their number in Toronto must be small. I asked him if it were common in the homeland. His reply was "No, very rare. It is the change of food and other circumstances that does it". Intermarriage between different races is also a factor in difficult labour. This subject is being more fully investigated. Only consummate care can meet the situation, and we must set about devising this and forming it into a national system.

One may consider the subject under four headings: pre-natal care, natal care, post-natal care, education.

Pre-natal care

The victims of heart disease, chronic nephritis, tuberculosis and diabetes are sometimes brought into mortal danger by child-bearing. Even when death does not immediately result, life is definitely shortened. They should be restrained from maternity. Venereal disease should be completely cured before pregnancy is tried.

Eclampsia and albuminuria of pregnancy are credited with 20 per cent of the mortality. Patients who attend our pre-natal clinic, obey instructions, and come to the hospital for confinement, show no mortality from these troubles, though incipient cases are numerous.

Pre-existing foci of infection in teeth, tonsils, appendix and other situations sometimes cause death in the puerperium. They should be eliminated before labour. The expectant mother should avoid all known cases of communicable disease, and all crowds wherein such infection often exists unknown.

Contracted pelvis should be detected early, and a proper plan of

†*Chairman, Committee on Maternal Welfare, Academy of Medicine, Toronto.*

**Read in part at a meeting of the Obstetrical and Gynaecological section of the Academy of Medicine, Toronto.*

campaign laid out to meet each case. The danger from these is thus greatly reduced. The same may be said of tumours of the uterus and abnormal positions of the foetus.

Anæmia is a frequent result of pregnancy, or may precede and be aggravated by it. Treatment by reduced iron, iron given hypodermically, or blood transfusion, combined with suitable diet and fresh air usually cures (I have dealt with this question in a previous article in this journal.[1]) Pernicious vomiting in our metabolism ward is cured in 90 per cent of the cases, and the life of the remainder saved if the incurable case is recognized and abortion induced in time. Pernicious vomiting is a dangerous condition and should be treated only by specialists in a well-equipped hospital. A general supervision of health throughout pregnancy is essential.

Natal care

One may discuss hospital *vs.* home care under this heading. Private ward, special nurse and specialist care give good results, but may be too expensive or not available. The gathering together of numbers of patients in a single ward creates a danger of its own. Eternal vigilance, rigid technique, and facilities for isolation are the price of safety. A good technique and after-care at home is as safe a scheme in normal multiparae, and much cheaper for patient and state alike. Primiparae and all complicated and operative cases should go to a good hospital.

Inasmuch as the *streptococcus haemolyticus*, our chief enemy, is commonly found in the human nose and throat, adequate masking (four thicknesses of gauze) of all persons in attendance at labour and doing dressing for four days after birth is the rule of our hospital. The mask must cover the nose as well as the mouth. Infection from this source has been traced fairly definitely to carriers in our own and other clinics.

Shock and haemorrhage cause some deaths. I shall deal with this subject later. To decide upon and perform Caesarean section should be the province of the skilled obstetric surgeon. It has been shown to be a much more fatal operation in other hands.

Post-natal care

Sterile dressings only should be applied to the vulva, and at least for four days, the nurse who changes them should wear a mask. If a perineal repair has been done, and infection of it taken place, no further repair of it should be attempted until the temperature has been normal both morning and afternoon for at least two weeks. Premature repair of an infected perineum has spread infection and ended in death.

Education

The public has been long in recognizing the dangerous nature of child-birth, and slow to accept supervision throughout pregnancy. Yet efficient pre-natal care remains our best means of immediately reducing maternal mortality. The work of various women's societies in spreading this view cannot be too highly commended. The importance of obstetrics should be more thoroughly recognized in medical teaching, and more time given to the subject. Most medical men must do some obstetrics. We shall not, I fear, be able to extend the students' privileges much further in the hospital, but an out-door service would enlarge their field of practical experience. The physiology of reproduction receives but small attention in the primary course at the university. This should be remedied and research stimulated. Honourable mention should be made of the recently established urinary test for pregnancy, and the work done by the anthropological department.

Provision for Confinement in the Home

I have given but a brief résumé of the time, skill, and care necessary. How are these to be made available?

The poor are well looked after in the pre-natal clinics and public wards of the city hospitals, either at their own or the city's expense. But the amount received does not pay for the upkeep of the departments. Now probably 50 per cent of the multiparae so attended could be just as safely confined at home by a doctor aided by the nurses of various local nursing societies. These societies do good work and could do more and better. Sterile dressings for this work could and should be provided by the local board of health at small cost. Your Committee has been urging this course on the board for some time. If students' work from an out-door department were added more visits could be paid and better records kept, showing morbidity as well as mortality, and further means of avoiding both developed. Some such method is in operation in all other large maternity clinics of the world, and gives good results.

People of the intermediate class have always been the hardest to provide for. Time, care and skill cost money, but I do not believe that this difficulty is insuperable. It has been suggested that small "maternity homes", whose overhead expense is low, might be established. I should not care to recommend the system without further investigation.

In rural communities the establishment of small hospitals throughout Ontario has been suggested by many practitioners of experience who have been consulted by your Committee. Where the population is widely scattered, much might be said for this plan. Provincial aid would probably be necessary.

An Obstetrical Conscience

I would now address a word to the obstetrical conscience of my professional brethren. Hospitals have devised an efficient technique. The essentials should be provided for home work too, but difficult operations should not be done without the fullest facilities. Shock and haemorrhage are given as the causes of some deaths. Apart from accidental haemorrhage or placenta praevia these should not occur. They are but too often due to premature or otherwise unskilful use of forceps, versions, or manual placental removal. The skilful use of narcosis, as contrasted with anaesthesia, will enable the patient —and her friends—to endure. Too much chloroform predisposes to post-partum haemorrhage.

If pre-natal and natal care can practically abolish the death rate of eclampsia in a hospital clinic, why is 20 per cent of the provincial maternity death-rate due to it? The man who calls child-birth a "physiological process" and lets it go at that, and the man who practises meddlesome midwifery are both to be blamed. Even the specialist may sometimes be tempted into doing what he can do rather than what he should do. Judgment and skill must be developed by education and experience. I trust these few words may help.

[1]*Kennedy C. McIlwraith, 1930. Nutrition and Pregnancy, Canad. Pub. Health J., v. XXI, pp.* 513-515.

Canadian Public Health Association

EDITORIAL
AND
BUSINESS OFFICES

Please note the new address:

105 BOND STREET
TORONTO 2, ONT.

The Control of Measles and Whooping Cough*

A. L. McKAY, B.A., M.B., D.P.H.,

Department of Health, Ontario

THE mortality rates per hundred thousand population of the commoner communicable diseases occurring in Ontario are shown in Table I. Diphtheria ranks first. Next in order come whooping cough with 5.6 per hundred thousand, and measles, with a rate of 4.2. Following these, are typhoid fever, meningococcus meningitis and scarlet fever, with rates of 2.3, 2.2 and 2.1 respectively. The next in order is poliomyelitis, with a death rate of 1.3 per hundred thousand, and last of all, smallpox, with a death rate of .03. These figures of the year 1929 are representative of similar data of the previous five years in Ontario.

TABLE I

COMMUNICABLE DISEASES DEATHS—PROVINCE OF ONTARIO, 1929

Diseases	No. of Deaths	Rates per 100,000
Diphtheria	242	7.4
Whooping Cough	185	5.6
Measles	139	4.2
Typhoid Fever	86	2.6
Meningitis	75	2.3
Scarlet Fever	69	2.1
Poliomyelitis	42	1.0
Small Pox	1	.03

Last year the Province experienced a wide-spread epidemic of poliomyelitis, but the early use of convalescent poliomyelitis serum was probably the major factor in keeping the death rate from this disease within very narrow limits.

Twenty years ago and more the typhoid fever death rate was not in fourth place, but was more nearly vying with diphtheria for first place. Similarly, scarlet fever, which now shows a death rate of 2.1 per hundred thousand in 1920.

However, diseases which have given us the most consistently high death rates, defying the control measures put into effect by the health departments are whooping cough and measles.

*Presented at the Annual Meeting, Ontario Health Officers' Association, Toronto, May, 1930.

The mortality from measles, whooping cough, diphtheria and scarlet fever by age groups for the period 1924-1928 in Ontario are shown in Table II. Table III shows that 70.6 per cent of the total deaths from measles occurred in the first three years of life. There is in this some significance in regard to certain rational control measures which might be instituted.

TABLE II

PROVINCE OF ONTARIO, 1924-1928——MEASLES, WHOOPING COUGH, DIPHTHERIA, SCARLET FEVER DEATHS

Age group—0-14 years

Disease	Age Groups							
	Under 1	1	2	3	4	5-9	10-14	Total all ages
Measles	128	173	54	35	21	67	25	503
Whooping Cough	649	226	48	29	36	35	5	1028
Diphtheria	61	106	135	151	155	473	66	1147
Scarlet Fever	21	50	75	47	47	115	69	424
Total	859	555	312	262	259	690	165	3102

TABLE III

ONTARIO, 1924-1928—MEASLES, WHOOPING COUGH, DIPHTHERIA, SCARLET FEVER PERCENTAGE OF DEATHS

In Age Groups 0-3 Years

Disease	Age Group 0-3 Years
Measles	70.6%
Whooping Cough	89.8%
Diphtheria	26.3%
Scarlet Fever	34.4%

As is well known, deaths attributed to measles are not usually due to measles infection *per se*, but rather to the complication of bronchopneumonia, especially in infants and young children. Some effort must be made to reduce the mortality from measles by applying methods of control to this age group if we are to keep faith with the public. Measles is highly contagious, and anyone who has not suffered from an attack of the disease will, almost surely, be infected if intimately exposed to one suffering from the disease. One factor in the control of measles which must be stressed is the fact that the most infectious period is before the appearance of the rash, and in most cases, before the diagnosis has been made. In the average household where a child contracts the disease at school and is home for several days feeling poorly before the eruption appears the younger children in

the household have been exposed to the infection before the diagnosis is made. Our problem, therefore, is to prevent the young child contracting the disease, or render the attack so mild that the dread of the terminal broncho-pneumonia is lessened. Such a means is now at hand in the use of serum from cases recently recovered from the disease, or, if this is not obtainable, whole blood from the parents, who, in 95 per cent of cases, have had measles sometime in childhood or later. This practice has been used quite extensively, both on this continent and in Europe. The reports from the use of either of these methods show excellent results. Even in institutions housing young infants, where in the past epidemics of measles resulted in a terrific loss of life, this procedure has been highly successful. One method which has been recommended is the withdrawing of 30 cc. of blood from the vein of the parent, and then immediately injecting this whole blood in 15 cc. amounts into each buttock of the child. If given before the seventh day of the incubation period, it will result either in the complete protection against the infection, or, what some consider better still, a modified attack of measles, with very little coryza or other disturbance, and little danger of developing pneumonia. The immunity produced by this modified attack of measles seems to be comparable to that resulting from a frank attack of unmodified measles. For older children, those five years and over and especially those undernourished or recovering from some other infection, who have been exposed to measles, this practice should be given consideration, but in this age group it is advisable to give double the dose of the parent's blood to the child. As mentioned before the experience last year with the use of convalescent serum in poliomyelitis was most encouraging, and I would suggest that this method of reducing the death rate from measles be given a trial. All the physician needs is a 30 cc. syringe, and the procedure can be quite readily carried out in the household.

In analyzing the deaths from whooping cough in the same age group as shown in Table II, it is found that 89.7 per cent of the deaths due to whooping cough occur within the first three years of life. This is even more striking than the figures just quoted with respect to measles. Here, too, it is usually the complication of broncho-pneumonia which terminates these cases fatally. What can we do to prevent these deaths?

In the control of any communicable disease there are two factors which must be considered—the separation of those who are ill with the disease from those who are well, and second, the artificial immunization of those who may be exposed to the disease where such immunization is possible.

We have in whooping cough a situation similar to that in measles, namely, that at the time of the initial symptoms of the disease, when coryza, sneezing and coughing are present, and when the disease is in the most communicable stage, the diagnosis is difficult to make and

timely precautions are not, therefore, taken for the protection of the other members of the household from the initial case.

However, with whooping cough we are more conveniently armed for immunization than we are in the case of measles in that the particular organism (the Bordet-Gengou bacillus) is recognized as the cause of this disease. For years a vaccine has been prepared using this bacillus, and is distributed by the Department. It is true that there is some difference of opinion as to the efficacy of this product, but, where carefully kept records have been made in a large series of cases in which pertussis vaccine has been used as a prophylactic measure, there seems to be strong evidence that it has a beneficial effect, at least, in ameliorating the severity of the disease. Madsen of the Serum Institute of Denmark reports recently very interesting findings in the use of pertussis vaccine for modification of attack and in early treatment. He claims that prophylactic use of the vaccine in contacts does not effect complete immunity, except in a few cases, but his results have other significance.

In 2094 vaccinated patients given vaccine before or during the initial catarrhal stage only 6 deaths occurred; whereas in 627 patients who were given no vaccine 18 died. The case fatality rate in the vaccinated group was 0.28 per cent and in the non-vaccinated group was 2.8 per cent. That is, by the early administration of vaccine to contacts, in a large series, the death rate amongst those receiving vaccine was just one-tenth of that in the control group who received no vaccine. Another point which is of importance is the provision of proper diet and nursing care for these cases, preferably at home if conditions are suitable. If this is not practicable one should consider the advisability of removing the younger members to another household where they cannot infect other children if they develop the disease, but can be given the full benefit of this form of vaccine immunization without being exposed to subsequent massive doses of infection as they would be if they remained in the quarantined house.

The use of convalescent serum similar to that used for the modification of measles has been suggested. I can, however, give you no data in regard to this method of immunization, but I do feel it is well worth a trial.

We realize our inability to cope with the spread of these two diseases once they have gained epidemic proportions in any municipality, but I submit that we should not sit back and watch these diseases take the toll of young lives such as they have been doing in the past. They are the cause of a great deal of lost time and disorganization of school routine, which is very difficult to obviate, but I would plead for redoubled efforts on your part to reduce as a cause of death these two most common diseases, especially in the age group which gives this very high mortality.

Classification of Causes of Death in a Municipal Health Department*

T. E. ASHTON

Chief Statistician, Division of Vital Statistics, Department of Public Health, Toronto

THE title of this paper designates one of the major activities of a statistical division in a municipal health department. It is presented with the hope of enlisting the co-operation of both public officers and private practitioners in an effort to obtain more accurate information and uniform methods in the classification of the causes of death. In such a section as this, municipal health departments may accomplish much through the mutual exchange of experience. We may thus reach an agreement as to methods which will render our statistics more comparable, and therefore, more valuable.

Vital statistics record the story of a health department's work. Through them its progress may be traced from year to year and from one administration to another. Their study enables a health department to set a definite goal of attainment, and the degree of approach to that goal may be taken as a measure of the success of the work of the department. The needs of public health demand current information. The health officer must know the changing points of attack, he must evaluate the health of his own city by comparison with conditions then existing in other communities. He must have this information before it becomes history, and it is at this juncture that his own division of vital statistics is able to provide the essential data.

The collection of vital statistics inherently demands a certain amount of medical knowledge, and yet the responsibility for registration of these vital facts rests by law, not with the health department, but with the clerk of the municipality, who is the division registrar. Through the co-operation of the City Clerk's department, the division of vital statistics obtains the loan of both birth and death certificates.

It is quite evident from perusal of instructions to physicians on the issued certificate of registration of death, that the information required by the Registrar-General, and that desired by a health department, are not, and cannot be, identical. The request that "physicians should state the cause of death in plain terms, so that it may be properly classified," dismisses very vaguely a major task of the vital statistics division. We are, therefore, left more or less to our own devices in the task of correctly classifying the stated causes of death.

**Presented at the Vital Statistics Section, Canadian Public Health Association, May 20th, 1930.*

Accuracy of Stated Causes of Death

In this procedure we must, of necessity, bring all causes under titles appearing in the international list. This operation in itself frequently necessitates checking as to the accuracy of the stated causes of death. A recent tabulation by our own department shows that in practically fifteen per cent of the certificates of death in Toronto, additional information is required to enable specific classification of causes of death. This additional information is, of course, of more interest to a municipal health department engaged in making special studies of mortality.

In the experience of this department, essential facts are omitted on certificates of death by physicians, often through lack of interest in or failure to appreciate the value of vital statistics, but most frequently through misunderstanding of the terms primary and secondary causes of death.

The essential part of a medical certificate for statistical purposes is a statement of the disease or violent or natural cause of death, which initiated the train of events leading to death, and, under no circumstances should that essential be omitted. Secondary or contributory causes are of great value, and should be added to the certificate, but in no case should they be stated to the exclusion of the primary cause. Terminal conditions, such as heart failure, syncope, and exhaustion should never appear on a certificate of death.

Merely naming the organ which was diseased, without giving an indication of the nature of the disease is inadequate. It is not sufficient to certify death as due to disease of the stomach, disease of the heart disease of the lungs, etc.

If the above rules were understood and rigidly adhered to by physicians, much time and labour now expended in obtaining this essential information could be more profitably employed.

Many instances could be given of terms commonly used in certifying causes of death which necessitates further inquiry for their proper classification. For example, the term "cerebro-spinal meningitis" calls for the qualifying adjective "epidemic" or "tuberculous," resulting, in either case, in altered classification. In tuberculosis, the organs involved are stated. In pneumonia, state whether broncho or lobar type, and if terminal, the predisposing cause. Causes such as septicaemia, peritonitis, embolism, encephalitis, gangrene and intestinal obstruction, when given alone, are almost useless for correct classification, unless accompanied by the primary cause upon which they are consequent. Terms such as fractured skull, drowning, suicide, crushed to death, accidental haemorrhage, should always be qualified by stating the means and nature of the injury, and whether they were accidental, suicidal or homicidal. Instructions are printed on the medical certificate as to the proper way of stating deaths caused by external violence, yet it is surprising how many certificates of death omit this information.

It is interesting to note from a recent tabulation by our division of

statistics, that in deaths returned as caused by pneumonia, additional information revealed the presence of tuberculosis. Accidental burns and puerperal causes were found as a result of questioning deaths from septicaemia. Cancer, duodenal ulcer, hernia, etc., have been revealed by questioning deaths from intestinal obstruction.

Such instances appear to indicate the value of our follow-up work, and the ever-present possibility of erroneous statistics of mortality resulting from the acceptance of unscrutinized stated causes.

Method of Selecting Primary Cause

Having checked as far as possible the accuracy of the stated causes of death, we have still to consider the adoption of a method for selecting primary causes where two or more causes of death are jointly stated on a medical certificate.

Representatives of many countries after numerous conferences agreed upon the adoption of the well-known International List of Causes of Death. Comparable statistics of mortality for all nations in exchanging current information on the prevalence of disease, is a goal long dreamed of by all interested in public health, but the use of this list is no guarantee of the comparability of these statistics. This misfortune is due to the employment of different rules for selection by the various nations, which at once affect the tabulation and classification of the statistics. Separate manuals for use with the International List have been adopted by England and Wales, and the United States, respectively. Their rules for selection are similar, but not identical.

The following examples will illustrate the result of employing different manuals in the tabulation of the causes given in the International List:

In the United States in 1925, 25,495 deaths from cerebral haemorrhage out of a total of 82,651 so classed in primary tabulation were complicated by arterial disease as a contributory cause. According to English practice, these deaths would have been classified as due to arterial disease, the cerebral haemorrhage being regarded as a consequence. Likewise, our own Dominion Bureau of Statistics, which uses the original French manual—one most closely related to that of England and Wales—shows for 1926, out of a total of 4,981 deaths from arterial disease, only 1,714 in which cerebral haemorrhage was given as a contributory cause. This indicates that directly opposite rulings are employed by different countries in tabulating the same combination of causes.

A striking example of difference in method is shown in influenza statistics published in tables of contributory causes in relation to those selected as primary by the United States and Canada. In the United States for 1925, 30,538 deaths were attributed directly to influenza, 9,483 deaths from influenza were classified as being contributory to other causes of death. Canada in 1926 shows 5,174 deaths primarily

caused by influenza and in only 133 was influenza shown as a contributory factor in deaths attributed to some other cause. This means that in the United States the ratio of influenza deaths from the point of classification is 31 as contributory cause of death to 100 selected as the primary cause. The ratio for Canada is between two and three to 100. This provides an interesting problem from a municipal health department standpoint. During an epidemic of influenza the medical officer of health asks his statistician the question, "How many influenza deaths have occurred in Toronto to date?" When informed, he complains that, according to newspaper reports from a nearby American city, where influenza is known to be just as prevalent as it is in his own city, fewer deaths have occurred over the same period. Why is this the case? There is no other reason than that preference is given to influenza when jointly stated with other causes in Canada, whereas in the American city, some other cause is preferably chosen as the direct cause of death. A similar problem is raised in other Canadian cities whose organization permits of the classification of the causes of death in their own department.

There is an excellent manual in use in the United States to which the cities of that country may turn for guidance in maintaining a uniform classification. England and Wales also have such a manual, but in Canada we have not such a guide. This, then, is our problem. Should we adopt the American manual and in so doing broaden our scope for comparison with many more cities of our own size? Should we in Canada adopt the method used by our own Dominion Bureau of Statistics? These are based principally on the original French manual which has long been out of print.

In Toronto we have been fortunate in obtaining rulings direct from our Dominion Bureau of Statistics in difficult cases, but for routine work we are forced to fall back upon the manual of England and Wales as the one most nearly resembling that employed at Ottawa.

However, the health departments of other growing Canadian cities are bound to develop their own divisions of vital statistics, and it seems inevitable that some decision as to the adoption of a common manual must be made in the near future if we are to attain any uniformity in our work.

Editorials

THE CANCER PROBLEM

THE recent announcement by the Premier of Ontario of his intention to establish a Royal Commission for the investigation of cancer treatment has given high hopes to those interested in the control of a grave public health problem.

There is some conflict of opinion as to whether the apparent alarming increase in the incidence of cancer is a real increase or whether this increase is due to better diagnosis, more accurate records or to an increase in the number of persons of the cancer age. Whether or not these factors suffice in accounting for the increase, the fact remains that in 1929 there were 8793 recorded deaths from cancer in Canada, and that the affection, as a "killing" disease, has now usurped the place of tuberculosis and stands second in this category. Moreover, since there are estimated to be $2\frac{1}{2}$ or 3 times as many cases as deaths, the number of cancer cases in Canada cannot fall far short of 25,000 a year.

Cancer is usually an insidious disease. In its most common form—cancer of the alimentary tract—early diagnosis, the most important of all factors in the cure of the affection, is difficult, and treatment is correspondingly unsatisfactory.

According to our present conception, the cancer cell at the outset is a normal cell which has acquired, for some unknown reason, the power of rapid proliferation, and is able to influence neighbouring healthy cells to follow its riotous example. This power of rapid and repeated division of the cancer cell is probably the fundamental basis of its successful control by modern measures. The rapid proliferation of the cancer cell is its weak spot; because of this weakness, a cancer is more amenable to treatment than otherwise.

The control of cancer involves methods of prevention and methods of cure. The preventive measures may be summed up briefly under early diagnosis, early observation and treatment of so-called precancerous condition, and education of the public in the avoidance of causes of local irritation. While there is no certainty that irritation actually causes cancer, there is ample evidence that such irritation is frequently followed by cancer. Examples of this are seen in the prevalence of cancer of the surface of the body, of the alimentary tract, the

cervix of the uterus, the rectum, etc. As an exciting cause of cancer there seems no doubt that local irritation is a prominent factor. Public health education in respect of cancer is of similar importance to education in other public health fields. The public, and even many of the doctors, are woefully ignorant of the simple facts respecting malignant disease. The control of tuberculosis dates its beginning from the days when voluntary societies and health agencies first instituted the anti-tuberculosis movement. A similar movement is needed in cancer control. If the public is told the truth about preventable diseases, a marked step will have been taken in their control.

Since the general practitioner is usually the first one to see a suspicious case, much depends upon his alertness and ability in early diagnosis. This and the early observance and treatment of precancerous conditions are of the utmost importance in the reduction of cancer mortality.

The cure of cancer involves the use of surgery, the X-Rays and radium. Most important in the treatment is early diagnosis. This is relatively easy in cancers of the surface of the body, of the skin, lips, mouth and throat. Diagnosis of internal cancer is increasingly difficult the deeper one goes. Of all auxiliaries in diagnosis of internal cancer the X-Rays is the most valuable.

With early diagnosis surgery remains the chief measure of treatment in cancer of the internal organs such as the intestines, the stomach and the uterine body. Combined with the use of X-Rays and radium, surgery offers, in early cancer, a high proportion of cures.

For cancer of the surface of the body, the skin, lips, tongue, mouth and throat, the cervix of the uterus and in some cases of rectal growth, the use of radium is the most modern and effective treatment. Its effect is similar to that of the X-Rays, but, with the machines in use at present, X-Rays are less effective than radium. Radium and X-Rays appear to have a selective action on the cancer cell probably because of the active proliferation of that errant body. The satisfactory use of radiation involves high expense, and the most skilful technique. For these reasons it is a treatment for hospitals in large centres of population and not one for the great mass of physicians. The phenomenal advances made in the technique and results of radiation treatment since the beginning of the century seem to give promise of still greater accomplishments in this direction, and it is gratifying that the government of Ontario has decided to make the subject one of careful enquiry in order to minimize as far as possible, future errors in cancer control.

John W. S. McCullough

PUBLIC HEALTH NURSING

RUBY M. SIMPSON, Reg.N., and BARBARA A. ROSS, Reg.N.

"Le Bien Etre de la Maternite et de l'Enfance dans les Unites Sanitaires de Comtes"

(Rôle de l'infirmière visiteuse)

MLLE. L. DIONNE, Unité sanitaire de Témiscouata

En acceptant de présenter devant vous un travail, j'ai certes commis un petit péché féminin, lequel je n'ose vous dire, mais que jamais je ne répèterai. Le pourquoi de mon ferme propos, si d'abord il vous échappe, vous ne tarderez guère à le comprendre par les lignes qui suivent.

Le champ d'action de l'infirmière visiteuse pour l'Hygiène maternelle et de l'enfance est pratiquement la campagne dans une Unité sanitaire. Chez-nous, comme par toutes les Unités de comté la campagne ou mieux la paroisse, pour en étudier qu'une seule, se présente sous un double aspect; il y a le clocher autour duquel se groupent un nombre variable de maisonnettes constituant le village; il y a les demeures s'échelonnant le long des divers chemins, qui émanent du centre villageois et qu'on appelle les "rangs".

La population moyenne d'une paroisse est de 1200 âmes; 300 embrassent la période dite de l'âge de l'enfance et quoique 8 fois l'an seulement le mariage s'y célèbre, les naissances elles, s'élèvent à 51, dont 3 sur 5 chez ces bonnes gens cultivent la terre et loin même de 7 milles et plus du village.

Si par 10, vous multipliez ces quelques chiffres, si vous tenez compte des distances considérables à parcourir, si vous n'oubliez pas la rigoureuse saison et les temps mauvais du printemps et de l'automne, vous comprendrez combien difficile est à remplir le rôle de l'infirmière quand il lui faut coordonner ce travail de l'hygiène maternelle et de l'enfance avec celui de l'assistance aux cliniques, les séances de vaccination, la course aux maladies contagieuses, que sais-je et votre indulgence je n'ai pas à y faire appel.

De la fin de mai à la mi-octobre, la visite se fait par les "rangs", choisissant de préférence ceux qui sont les plus éloignés ou inaccessibles; aucune maison n'est omise et la chose qui est à la fois la plus difficile et le plus importante, c'est de savoir plaire à ces braves gens. De fait, de cette première entrevue, si elle est heureuse ou mauvaise, résultera ou non un bien inestimable: ce sera, une grossesse conduite à terme ou une naissance prématurée; ce sera une mise au monde comme par enchantement ou compliquée de présentation vicieuse, d'albuminurie ou d'éclampsie; ce sera un bonheur compris que celui d'être mère ou l'on aura en horreur la famille; ce sera un bébé bien constitué.

de croissance normale ou un débile, un rachitique; ce sera un mal-nourri qui par le régime récupérera son poids ou un chétif voué à la tuberculose; ce sera des amygdales hypertrophiées, des dents cariées, un nez obstrué que le clinique, la consultation du médecin améliorera, guérira ou des maux de gorge répétés, une dentition entièrement défectueuse, une respiration buccale; ce sera la contagion des maladies expliquées, la vaccination, l'immunisation comprise ou le dicton de quelques grand'mamans qui veulent que tous les enfants aient la rougeole, la coqueluche. . . .; ce sera les pamphlets distribués, les pièces de littérature commentées et suivies ou les conseils des bonnes vieilles qui voient toujours d'un oeil incrédule ce qui leur semble du nouveau. A l'infini, pourrions-nous multiplier ces points divers sur lesquels il nous faut le plus attirer l'attention suivant les besoins constatés. Toujours rejetant du langage tout mot recherché, nous nous efforçons d'être très explicite.

Le temps que demande une visite telle est variable il va sans dire, d'ordinaire vingt minutes et la moyenne d'entrevues par jour se chiffre à vingt-deux. Une fois les renseignements jugés utiles donnés, nous remplissons le rapport quotidien formule U.C. 2 du Service Provincial d'Hygiène et dans un cahier nous notons avec détails, le mois de gestation, la date probable de l'accouchement, le nom du médecin traitant, l'âge du bébé, le régime établi, le pourquoi des conseils donnés, toutes choses en un mot qui pourraient à la fois et faciliter notre travail et surtout venir plus en aide aux familles, dans les visites subséquentes, l'envoi des lettres du Conseil Canadien de la Sauvegarde de l'Enfance, et la correspondance que nous avons soin de tenir scrupuleusement à chaque mois avec les mamans qui veulent bien nous expliquer leurs conditions, l'état de leurs enfants que sais-je. Sous la direction de l'Officier médical, nous leur répondons toujours, accompagnons nos lettres de pièces de littérature appropriées.

Durant la froide saison c'est-à-dire l'hiver, nous ne voyons ces familles des "rangs" qu'à l'occasion de l'examen des élèves des classes. Le Curé, le dimanche au prône, annonce qu'à tel jour, qu'à telle heure, nous serons à l'école numéro 8, rang St-Joseph par exemple; il exhorte les mamans à bénéficier de la venue de l'infirmière, du médecin même, parce que ce dernier se fait un devoir d'aller, quand il lui est possible, connaître ces bonnes gens et constater leurs multiples besoins. Une fois l'examen médical des élèves accompli, la conférence d'hygiène scolaire donnée, nous consacrons tout le temps nécessaire pour bien répondre à celles-là qui viennent nous consulter, consultations que précède une courte conférence d'hygiène maternelle si l'assistance des mères est assez nombreuse. Sur la route, que de fois n'arrêtons-nous pas, soit qu'une demande nous ait été faite quelques jours auparavant, soit que la maman nous ait remis par son enfant à la classe ce que l'on appelle "un petit papier" sollicitant notre visite.

A la saison des neiges, la visite de maison-en-maison ne s'effectue que dans les limites du village, accomplissant ainsi un travail analogue à celui ci-haut mentionné. Dans les centres à population plus intense ou les villes, une fois la semaine il y a en

plus l'école dite "des petites mères"; y sont admises les jeunes filles de 16 ans et plus, les jeunes mamans; un cours théorique de leçons d'une heure embrassant ce que toute maman doit savoir leur est donné. Des exercices pratiques sur la préparation du lait, la layette du bébé etc. . . .suivent ces leçons.

Il n'est pas possible à une infirmière de visiter dans un an toutes les familles de son territoire; se basant sur le programme d'abord tracé et des paroisses déjà parcourues, un travail de deux années est nécessaire pour mener à bonne fin l'oeuvre qui nous est si chère.

Pour les paroisses non visitées, les bulletins statistiques nous sont d'un grand aide. A chaque mois la liste des mariages et naissances de chacune des paroisses est classée, et si cette tabulation nous permet de se mettre en relation avec les familles ignorant ce que nous pouvons faire pour elles, elle nous permet aussi de constater combien les familles visitées apprécient notre travail. Dans l'Unité sanitaire de Témiscouata, permettez-moi de dire que 86% de ces dernières sont en continuelle correspondance avec nous, tandis qu'à peine 20% des premières daignent répondre à nos invitations.

Cet exposé bien pauvre hélas, s'il vous donne une idée du travail que nous nous efforçons d'accomplir, il ne vous montre rien de celui que nous voudrions effectuer. Le coeur admirable de ces bonnes gens nous attire, leur courage nous rend plus fortes, leur pauvreté nous fait meilleures et vous dire que nous aimons notre oeuvre n'est pas assez.

THE NURSING SERVICES IN A COUNTY UNIT

LÉO NORA DIONNE, P.H.N.,
Sanitary Unit, Témiscouata Co., P.Q.

When I agreed to address you on this subject, I certainly was guilty of a little sin dear to women, which I will not disclose but which I will not commit any more. You will soon discover, by reading the following lines, the reason of my resolution never to sin again in the same way.

The field in which the visiting nurse of a sanitary unit devotes her activities to maternity and infant hygiene is confined practically to rural districts. In our district, as is the case for all county units no doubt, the parish, to take but one example, must be studied from two angles; there is first the little church around which is found a certain number of houses forming the village; then, there are the houses built alongside the various roads spreading from the village and which we call rural districts.

The average population of the parish is 1,200; 300 of whom are in the period of infancy, and, though there are only about 8 marriages a year in that population, the births amount to 51, of which 3 out of every 5 are in the homes of those good people who work on the farm, sometimes situated seven miles from the village.

Multiply these figures by 10, add the enormous mileage to cover, do not forget the severe winter temperature and the spring and autumn bad

weather; then you will understand how hard it is to do the work of a nurse who has to combine this maternity and child welfare service with her work at clinics, vaccination hours, looking after cases of communicable diseases and what not, and you will not spare your sympathy.

From the end of May to the middle of October, we visit the "rangs", or rural districts, especially those that are farther off and most difficult of access. No house is passed by and the hardest but most important thing is to know how to win the confidence of these good people. From our very first visit to a home, whether we find it friendly or not, a great deal of good will follow. One meets with many conditions, so many opportunities for service, so much need of advice. For instance, a birth may be expected; it may be anticipated in all the happiness possible for the expectant mother, or sad to say, with a dread of children; it may be full term or premature; it may be an easy delivery or complicated with a very bad presentation of the child, by albuminuria or eclampsia; it may result in a well-formed baby of normal growth or a weak, rachitic baby; it may mean an underfed baby recovering its weight by a good diet or it may mean an unfortunate child exposed and doomed to tuberculosis; or there may be diseased tonsils, carious teeth, defective nasal conditions which, if not improved or cured by clinical and medical advice, form the basis for continual sore throats, probably presistent chronic infections, ruination of the teeth and mouth breathing. At the same time, even on that first visit, one can work in a word of advice on how many diseases are spread, of the great value of vaccination and immunization. Surely this should replace the grandmother's advice that every child should have measles and whooping cough. Literature and pamphlets, written especially for this purpose, are distributed and introduced by comments and advice. This will, of course, meet with opposition from the old women who always consider with scepticism everything that is new, but surely these young families should be given the benefit of our knowledge of these things and just as surely our word, in time, should be accepted in place of that of the old women. I could dwell indefinitely on the various points to which one might draw attention according to the conditions in each house, but one point I must make, as important as any, is that we should always use the clearest language possible, and we should make sure, not that we have said much, but rather, that we have been absolutely understood.

Of course, the time allowed to such visits varies a great deal; the average is 20 minutes and we make about 22 visits a day. When we have given adequate advice, we fill the daily report form U.C. 2 of the Provincial Bureau of Health and we take note, in a special book, with the necessary details, of the month of conception, the probable date of delivery, the name of the physician, the age of the baby, the diet given, the reason for advice—in a word everything that could either facilitate our work or be of any benefit to the family in subsequent visits. This information also helps in the sending of the letter of the Council on Child and Family Welfare, and in the monthly correspondence which we keep up with

the mothers who give us details on their condition or the health of their children. We always reply to such communications under the supervision of the medical officer and enclose adequate literature with our letters.

During winter, we see those families from the rural districts, "rangs", only when we visit the schools. On Sunday, the parish priest announces that on such a date, at a given hour, we will be at school No. 8 in district Saint-Joseph, for instance. He insists on the necessity for mothers to take advantage of the nurse's visit, or even the doctor's, because the doctor makes a point to go when at all possible and come in contact with the good people and see for himself what their needs are. Once the medical examination of the pupils and the lecture on school hygiene are over, we take the necessary time to answer the mothers who come to us for advice, these consultations being preceded by a lecture on maternity hygiene if the mothers are in sufficient number. On the way back, we often stop at houses where a mother has sent a request for advice a few days previously, or by means of a letter transmitted by a child in school.

During winter, home visits are confined to the village, where we do work similar to that described above. In larger centres or in towns, once a week, we hold what we call "young mothers' school", to which are admitted not only young mothers but girls of 16 or upwards. We give them a complete theoretical course in 14 lessons on the essentials that a mother should know. The lessons are followed by practical demonstrations on the preparation of milk, the baby's layette, etc.

One nurse cannot visit every year all the families in her district; it is essential to make a two-year programme based on the work to be done and the parishes already visited in order to accomplish the task which is so dear to us.

Statistical reports are very useful for the parishes that cannot be visited. Every month the list of marriages and births is classified, by parish, and, while these data make it possible for us to come in contact with families unaware of what we can do for them, it is useful also to see how our work is appreciated by families already visited. In the Témiscouata Sanitary Unit, 86 per cent of these latter families have been in constant correspondence with us, and at least 20 per cent of the former are kind enough to answer us.

This modest statement, while giving you an idea of our work, cannot show what we would like to accomplish. The wonderful sentiments of the good country folk exert a powerful attraction on us, their courage gives us strength, their destitution stirs our charitable instincts and it would be an inadequate statement to say that we love our work.

PUBLIC HEALTH ADMINISTRATION

J. W. McINTOSH, B.A., M.B., D.P.H. AND FRED ADAMS, M.B., D.P.H.

*The City Health Inspector**

RONALD GILBERT
Health Inspector, Department of Health, Prince Albert, Saskatchewan.

WITH the advance of sanitary science, the water supply which formerly presented a serious problem in the matter of public health, can now be easily safeguarded. The installation of filtering and chlorinating equipment assures a safe water supply providing, of course, that the plant is properly operated and then is chlorinated in the required quantities. It is now a simple matter for the Health Inspector to regularly and frequently check the chlorinating procedure by the use of the orthotolidin test. The use of this test, however, should not be a substitute for bacteriological control, for this test should serve only as a means for rapidly determining that an adequate quantity of chlorine is being added. Public opinion demands a pure water supply because the general public have long recognized the dangers of impure water.

Can this be said in respect to our milk supplies? Milk is our most important food, containing all the elements required for the growth of infants, and because of this, it enters into the dietary of all civilized people. Good milk has been more valuable than any other single food in restoring and maintaining health; on the other hand, impure milk has caused more sickness and death than any other food.

Dr. H. M. Speechly, President of the Winnipeg Health League, stated recently that 80 per cent of deaths in infants from diarrhoea are caused by impure milk. In addition, he stated that 25 per cent of all cases of tuberculosis in children under 16 years of age are caused by milk from tuberculous cows, while from 18 to 25 per cent of deaths under five years of age from tuberculosis are from this cause. Many epidemics of septic sore throat, scarlet fever, diphtheria, paratyphoid, and typhoid fever have been traced to an unsafe milk supply. Yet, in spite of these facts, and alarming as the situation is, the public conscience is not yet fully awakened to the dangers of a raw milk supply. It is in the matter of educating public opinion to the necessity of using the only safe milk supply, namely, properly pasteurized milk, that the health inspector can also be of assistance. Compulsory pasteurization in all urban centres should be the aim of every member of a health department. It can be accomplished, and should be accomplished with the least possible delay. It is, however, no easy task, for many objections will be

**Presented at the Fifth Annual Convention of the Saskatchewan Health Officials' Association, Regina, October 15th and 16th, 1930.*

raised, and there will be found many obstacles to overcome.

In Prince Albert efforts have been continuously made, and, though we have not yet reached our objective, 94 per cent of the milk supply is pasteurized. The remaining 6 per cent is from a Government-supervised, tuberculin-tested herd. We have had our difficulties in respect to securing compulsory pasteurization. By-laws to this effect were submitted to the Council in accordance with the City Act, but apparently the Aldermen were not convinced of the seriousness of the situation, and did not choose to pass that part of the by-law. However, at that time the Council did provide that all milk sold in the City for human consumption must be either pasteurized or be supplied from tuberculin-tested herds. This was a move in the right direction and has proved very beneficial, but recognizing, as we do, that properly pasteurized milk is the only safe milk supply, efforts for compulsory pasteurization are still being put forth by the health department, and we feel that in the very near future this objective will be attained. When this aim is realized, the work in respect to a milk supply will be by no means ended, for it must always be remembered that while proper pasteurization will make a milk supply safe, it cannot make dirty milk clean. Not only must milk be clean, but it must have a low bacterial count at the time of delivery to the pasteurization plant.

The problem of securing a milk supply possessed of these qualities is a difficult one, and the solution to this problem is chiefly a matter of educating those engaged in the production of milk in the methods of production and the after care of the milk until it is delivered to the pasteurizing plant.

"Quality Milk" Competition

Much work has been done along these lines in respect to Prince Albert's milk supply, and the situation to-day is encouraging. It might be interesting for you to know just what has been accomplished in this direction. In the spring of 1928, the City Health Department, in conjunction with the Saskatchewan Dairy Association, inaugurated a "Quality Milk Competition"; the object of this competition being to improve the quality of raw milk delivered to pasteurizing plants in the City.

All milk shippers were automatically enrolled as contestants in this competition. Samples were taken from shipments of milk at time of delivery to the pasteurizing plants for examination once each month. These samples were tested as to keeping quality, cleanliness, fat content, flavour, odour, and temperature. The standard tests used in conjunction with this competition were the methylene blue reductase test, sediment test, and the Babcock test. This competition was so successful in improving the quality of milk, that it was decided by the Health Department to make it a yearly competition, and this has been done with the invaluable assistance of the Provincial Dairy Branch. Competitors are kept well informed as to the results of each examination, individual score cards being sent out each month. In cases

where results have not been up to the standard, advice has been given as to the probable cause, and a remedy suggested. In some cases premises have been visited at milking time, and methods of clean milking explained and demonstrated. Where little improvement is shown, and the producer fails to produce milk of the required standard within a reasonable period of time, he is notified that further shipments of milk must not be made from his premises to the pasteurizing plants.

Purchasing Milk by Grade

It might be interesting to know that 78 per cent of Prince Albert's milk supply is purchased from the producer according to grade, the methylene blue reductase test being used as a means of determining the keeping quality of the milk, upon which the grade is based. Two grade standards are used, A and B, — a spread of five cents per pound butter fat being maintained at between these two grades. The deductions made during the month on account of B grade milk are returned to shippers as a premium on the grade A milk delivered. To my mind, all milk should be purchased according to quality, and there is no doubt that under such a system where the producer is penalized for poor quality milk, that more care is taken by him to see that milk delivered is up to the required standard.

The majority of our food supplies are purchased according to grades. Why then should not our most important food, a food so easily contaminated, containing all the substances especially favourable for bacterial growth, and the only animal food consumed in a raw state, be also purchased according to standard of quality? This is impracticable as far as rural districts are concerned, but should not be a difficult problem in urban centres where the necessary equipment is available for testing purposes, and the collection of samples an easy matter.

Other Problems

Another matter which I would like to present for discussion, and one which has given us considerable trouble, is in connection with enforcing the regulations in respect to the use of individual drinking cups and properly covered containers for the sale of liquid refreshments at summer fairs and circuses. Local organizations have been compelled to comply with these regulations, but they are looked upon as more or less a farce when persons holding concessions with travelling shows and circuses arrive in Prince Albert after travelling throughout the Province without having been requested to comply with these regulations. A careful check has been made after fairs and circuses have visited the City, and it has been found that cases of Vincent's angina have been, on several occasions, prevalent after such visits.

Need for Training of Health Inspectors

In conclusion allow me to briefly refer to the necessary qualifications of the Health Inspector. The situation to-day demands that the Health Inspector have a working knowledge of

many public health questions, especially so in centres where his executive chief, the Medical Health Officer, is a part-time official primarily engaged in his medical practice. Rapid strides are being made in the matter of preventive medicine, and sanitary science, and to be thoroughly efficient he must be well-informed in the latest developments, otherwise he will soon outlive his usefulness.

The matter of milk and water testing is becoming a problem in smaller urban centres, and should be recognized as such. Much good can be accomplished by the Health Inspector with a knowledge of this work. Cannot some provision be made whereby Health Inspectors may obtain special training in dairy chemistry and bacteriology? There are many inspectors who would avail themselves of this training if the opportunity were afforded. I am sure that civic authorities would welcome the opportunity of sending their inspectors to courses of instruction which were in the interests of public health. With a fully established laboratory in Regina, surely this should not be a difficult problem. Short courses might also be arranged in other matters pertaining to public health.

REPORTED CASES OF CERTAIN COMMUNICABLE DISEASES IN CANADA* BY PROVINCES—MAY, 1931

Diseases	P.E.I.	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Diphtheria	—	18	13	106	157	33	11	6	20
Scarlet Fever	15	31	22	274	831	55	107	61	65
Measles	—	32	2	2494	1222	1145	414	59	9
Whooping Cough	—	54	—	104	437	23	95	26	202
German Measles	—	6	—	32	195	†	3	11	4
Mumps	—	6	—	95	454	342	290	17	169
Smallpox	—	—	—	—	32	4	70	—	—
Cerebrospinal Meningitis	—	1	—	4	3	1	3	—	—
Anterior Poliomyelitis	—	—	—	2	3	1	—	2	—
Typhoid Fever	—	1	6	43	44	5	4	5	5

*Data furnished by the Dominion Bureau of Statistics, Ottawa.
†Not reportable.

INDUSTRIAL HYGIENE

F. C. PEDLEY, B.A., M.B., D.P.H. AND J. G. CUNNINGHAM, B.A., M.B., D.P.H.

INHALATION OF ASBESTOS DUST: ITS EFFECTS UPON PRIMARY TUBERCULOUS INFECTION*

PULMONARY asbestosis, a disease unknown, until very recently, has attracted the attention of physicians in many parts of the world and a very considerable number of articles have been written on the subject. The article under review is one of the first to describe the experimental production of asbestosis in animals and the experiments described may be considered to have completed the indictment of asbestos as a provoker of pulmonary fibrosis.

Guinea pigs and rabbits were exposed for 8 hours a day, 6 days a week to rather heavy concentration of asbestos dust obtained from Thetford Mines, Quebec. About 95 per cent of the dust particles were less than ten microns in size and more than 80 per cent less than 1.5 microns. Part of the dust was made up of true asbestos fibres and part of serpentine dust from the rock in which the fibres were imbedded. In the guinea pig the development of the early (two years and five months) response to inhaled dust is somewhat as follows:—The particles do not appear to penetrate to the terminal alveoli but are, for the most part, arrested in the lumina of the respiratory bronchioles. Here the dust particles are phagocytosed by mononuclear cells from the adjacent connective tissues. A low grade chronic inflammatory reaction may be set up about these bronchioles. No proliferation of the connective tissue with resulting fibrosis was seen in guinea pigs until after 500 days of dusting. Hyperplasia of the lymphoid tissue in the periphery of the lung may occur but the dust-containing phagocytes do not appear to migrate towards the lymphoid tissues as is the case with quartz dust. In guinea pigs the characteristic asbestosis bodies were found after 60 days dusting. In rabbits, however, no characteristic asbestosis bodies were found.

The authors devote a considerable amount of space to the discussion of the asbestosis body and come to the conclusion that it is a derivative of crystalline asbestos fibre which has been oxidized and hydrolized to a golden yellow amorphous structure. An early theory that it was protein in nature does not appear tenable since it resists calcination. Attempts to produce the body artificially met only with partial success.

Apart from the demonstration that asbestos dust would produce fibrosis in laboratory animals perhaps the most interesting part of the experimental work was the attempt to show whether asbestos dust would create a greater susceptibility to tuberculosis. For

Studies in Experimental Pneumonokoniosis VI, by Leroy M. Gardner and D. E. Cummings 1931, *J. Indust. Hyg., v.* 13, *pp.* 65 *and* 97.

the purpose an attenuated strain of tubercle bacilli was used. This strain produces in the great majority of normal guinea pigs a self-limited infection of the respiratory tract. The tubercles produced may caseate but in nearly every instance the caseating area ultimately heals leaving only a small scar. Of a large number of animals infected by the strain very few have developed generalized tuberculosis.

A group of 40 guinea pigs were inoculated by inhalation with this strain of tubercle bacilli and then placed in the dust chamber where they were exposed to asbestos dust until death occurred. A control group of 23 pigs were inoculated in the same manner but kept in a normal atmosphere; 31 of the 40 pigs in the dust room died, 4 of generalized tuberculosis, 17 from epizootic pneumonia and the rest from accidental causes; 9 were alive and apparently well at the time this report was written. Of the 23 control pigs, 20 died, 1 had generalized tuberculosis, 12 developed pneumonia and the rest died from accidental causes.

Another experiment was carried out in which 12 guinea pigs which had been exposed for 2 years in the dusting room were removed from the dusty atmosphere and inoculated by inhalation with the same strain of tubercle bacilli; 6 died and 3 were killed during the following 48 days, 6 of the animals showed pulmonary tubercles. The impression gained from these experiments was that the dusting did alter the course of the tuberculosis. The disease spread more in the dusted animals than in the controls. Metastatic disease in the spleen was common, an occurrence almost never found in the controls. The tendency to healing in the dusted animals, however, was marked whereas in animals dusted with quartz dust and subjected to inoculation with the same strain of tubercle bacilli continued, and progressive multiplication of the bacteria and consequent spread of the disease occurred.

These animal experiments in general appear to confirm the clinical observations to date.

A METHOD OF STAINING THE ASBESTOSIS BODIES FOUND IN THE SPUTUM OF ASBESTOS WORKERS*

GLOYNE describes three procedures whereby the asbestosis bodies can be made to take on a definite colour:

1. Sputum digested with concentrated antiform is centrifugalized, the antiformin is pipetted off and replaced by 5 per cent Erlich's Hematoxylen. The mixture is shaken and allowed to stand for half an hour. The asbestosis bodies become a dark brown to black colour.
2. After antiformin digestion mixture of 1 part potassium ferrocyanide (2 per cent) and 3 parts hydrochloric acid (1 per cent) is added. This is the Prussian Blue reaction and stains the asbestosis bodies a brilliant blue.
3. After antiformin digestion and solution of ammonium sulphide is added. The asbestosis bodies are coloured black.

There are certain advantages to these staining procedures. The structure of the bodies is better defined and the central asbestos spicule is often brought out.

*S. R. Gloyne, 1931, *J. Indust. Hyg., v.* 13, *p.* 85.

NEWS AND COMMENTS

P. A. T. SNEATH, M.D., D.P.H.

School of Hygiene, University of Toronto

THE Board of Governors of the University of Toronto have announced two recent grants towards the work of the School of Hygiene of the University. At the last session of the Ontario Legislature, provision was made by the Government for an annual grant of $14,250 to assist this School in making possible a greatly-needed expansion of its teaching facilities. It will be remembered that the establishment of the School of Hygiene in the University of Toronto six years ago was made possible by a munificent gift of $650,000 from the Rockefeller Foundation. Of this, $400,000 were devoted to the erection of a building, and $250,000 were set aside as an endowment for the support of two new departments which were essential in the work of the School.

The Rockefeller Foundation, through its International Health Division, has assisted in the establishment of schools of hygiene in several of the leading universities of the United States and such institutions as the London School of Hygiene and Tropical Medicine in England, and similar schools in Poland, Czechoslavakia, Jugoslavia, India and other countries. That the establishment of a School of Hygiene at the University of Toronto has been appreciated in Canada is evidenced by the fact that from all nine provinces in the Dominion, graduates in medicine in increasing numbers are attending the School to take a course of instruction leading to a Diploma in Public Health. From Quebec alone during the past two years thirteen physicians, holding appointments as directors of county health units, have been in attendance and have qualified for the Diploma. In all, during the past session as an example, 275 students received instruction in the School.

The rapid growth of public health work throughout Canada, calling for personnel specially trained in preventive medicine, has so taxed the facilities of the School of Hygiene in the University of Toronto that additional provision for their accommodation and for the enlargement of teaching and research work has been urgently needed. Recognizing this, the Rockefeller Foundation has now most generously given to the University the sum of $600,000 to supplement the endowment which was originally provided for the School by the Foundation. This endowment has thus been increased to $850,000, and plans for necessary expansion in the work of the School can be carried out immediately as a result of this splendid benefaction. The formation of a sub-department of chemistry in relation to hygiene will be undertaken, permitting of a more adequate presentation of this subject and enlargement of research studies in this field. Also, in order that the needs of the existing departments may be met adequately, it is planned to construct an addition to the School's present building which will increase accommodation by approximately 50 per cent. Erection of this new addition is to be commenced in the early autumn of this year and it is hoped that it will be ready for occupancy in the autumn of 1932.

New Officers—Canadian Public Health Association

At the Annual Meeting of the Canadian Public Health Association the following officers were elected for the year 1932: President, Dr. W. J. Bell, Deputy Minister of Health, Ontario; 1st Vice-President, Dr. Alphonse Lessard, Director, Provincial Bureau of Health, Quebec; 2nd Vice-President, Dr. M. R. Bow, Deputy Minister of Health, Edmonton, Alberta; 3rd Vice-President, Mr. E. E. Reid, Managing Director,

London Life Insurance Company, London, Ontario; General Secretary, Dr. J. T. Phair, Department of Health, Ontario, and Treasurer, Dr. C. P. Fenwick.

Awards for Thesis

The Canadian Tuberculosis Association have awarded to Dr. W. S. Stanbury, Calydor, the prize for the best thesis on a laboratory subject. Dr. Stanbury's thesis was entitled, "A Rapid Estimation of the Gold Excretion Under Sanocrysin Treatment". Two awards were made in the clinical field; namely, to Dr. W. S. Barclay, Saskatoon Sanitorium, for his thesis, "A Study of Tuberculosis Contacts in Families" and to Dr. L. G. Montgomery for "A Study of Tuberculosis in Indian Children". Ten studies were presented for consideration by the Committee. The Committee consisted of Dr. W. J. Dobbie, Chairman; Dr. J. W. S. McCullough; Dr. J. H. Elliott; Dr. Norman MacL. Harris; Dr. R. E. Wodehouse.

International Congress of Industrial Accidents and Diseases

THE Sixth International Congress of Industrial Accidents and Diseases will be held in Geneva, Switzerland, August 3-8, 1931.

Subjects for discussion include: Cutaneous Affections in Relation to Occupation (Accidents and Diseases), The Influence of Previous Health on the Results of Industrial Accidents and Diseases, Sequelae and Final Results of Traumatic Wounds of the Spine, Traumatism of Blood Vessels (Arthritis and Thrombophlebitis), Illness Affecting Men Working upon Cement and Artificial Stones, Reaction of the Organism toward the Toxic Substances Used in Industry, Fatigue.

British Columbia

DR. J. W. McIntosh, Medical Officer of Health, Vancouver, addressed the Annual Meeting of the Canadian Public Health Association in Regina on "Some Aspects of the Outbreak of Psittacosis in Burnaby, B.C."

Dr. Gregoire Amyot of the North Vancouver Health Unit and Mr. H. B. French, Recorder of Vital Statistics, British Columbia, attended the Annual Meeting of the Canadian Public Health Association in Regina, representing the Provincial Department of Health. Owing to a previous appointment, Dr. H. E. Young, Provincial Medical Officer of Health, was unable to be present.

Saskatchewan

TWENTY-FIVE rural municipalities are included in the bovine tuberculosis restricted areas. Eighteen of these are in the Last Mountain, Regina and Indian Head areas, and Qu'Appelle extension, and seven in the Saskatoon area. In the Estevan district of south-eastern Saskatchewan, seven municipalities have asked for the establishment of an area and it is hoped the tests will be carried out this summer.

Manitoba

THE twentieth Annual Meeting of the Manitoba Hospital Association was held at Portage La Prairie on June 15th and 16th. Nineteen hospitals of the province were represented at the Meeting by 53 delegates. Dr. J. H. Metcalfe, Portage La Prairie was elected president; Dr. G. S. Williams, secretary; and Dr. Dougald McIntyre, treasurer.

Applications are being received by the Board of Trustees of the Winnipeg General Hospital for appointments for Pædiatrician and Registrar for the Tumor Clinic. The Board accepted with regret the resignation of Dr. N. J. MacLean and Dr. R. F. Rorke who found it necessary to relinquish these respective appointments.

The Annual Meeting of the Winnipeg Medical Society was held on

May 15th. Dr. J. D. Adamson was elected president; Dr. H. D. Kitchen, secretary.

A specially selected committee of the Legislature has been formed to bring in recommendations for the proposed reform of the health services. The first meeting was held on April 11th. Members of this Committee are: W. Morton, Chairman; F. W. Jackson, M.D. (Field Secretary, M.M.A.), Secretary; Dr. E. W. Montgomery, Mrs. Edith Rogers, H. G. Beresford, D. L. Campbell, S. J. Farmer, Dr. H. McGavin, A. J. M. Poole, Dr. E. J. Rutledge, Ivan Schultz.

Ontario

THE University of Toronto announced through the Extension Department a short summer course for institutional workers commencing on July 6th and continuing for four weeks. It will be limited to 28 persons actually engaged in this field of work. The Canadian Council of Child and Family Welfare and the Canadian National Committee for Mental Hygiene have assisted in making possible this course which will be given by the Department of Social Science.

Dr. J. W. S. McCullough, Chief Inspector of Health for Ontario, has been appointed Secretary of the Royal Commission on Cancer. The members of the Commission left for Great Britain and the continent on the 26th of June.

The Provincial Department of Health was represented at the Annual Meeting of the Canadian Public Health Association in Regina by the following members: Dr. W. J. Bell, Deputy-Minister of Health, Dr. A. L. McKay, Dr. A. R. Riddell, Dr. A. E. Berry, Dr. N. H. Sutton, Dr. P. J. Moloney, Dr. J. T. Phair. From the Department of Health of the City of Toronto the following members registered: Dr. Gordon Jackson, Medical Officer of Health, Alderman Wadsworth, Mr. N. J. Howard and Mr. T. E. Ashton. Alderman Wadsworth was one of the speakers at the Board of Trade luncheon. Special reference was made at the opening general session by the Honourable Dr. Munroe, Minister of Health, Regina, Saskatchewan, and by Dr. F. C. Middleton, President of the Association, to the presence of Alderman Wadsworth, expressing the hope that municipal departments of health would follow the example of Toronto in having lay representatives of the Board of Health present at the Annual Meeting.

The Committee on Programme for the Annual Meeting were specially indebted to Dr. Alan Brown, Physician-in-Chief, Hospital for Sick Children, Toronto, for being present to address the Public Meeting which was held on Thursday evening under the chairmanship of His Honour Dr. H. E. Munroe, Lieutenant-Governor, Saskatchewan. Owing to prior appointments which almost prevented his coming and necessitated his immediate return, Dr. Brown was able only to attend the evening session. His address on "The Irradiation of Foodstuffs and the Significance of Solar Radiation from the Public Health Standpoint" was greatly appreciated.

Among those present from Ontario at the Annual Meeting of the Canadian Public Health Association were Dr. J. A. Amyot, Deputy Minister of Pensions and National Health, Dr. N. MacL. Harris, Dr. J. D. Page, Mr. G. H. Ferguson and Mr. W. R. Tracey from Ottawa; Dr. J. G. FitzGerald, Dr. R. R. Defries and Miss Mary A. Ross, School of Hygiene and Connaught Laboratories, University of Toronto, Dr. James Roberts, Medical Officer of Health, Hamilton and Dr. W. J. Cook, Medical Officer of Health, Sudbury, Ontario.

Quebec

A SERIOUS hospital-bed shortage exists in Montreal. Plans are under way for the building of the new St. Mary's Hospital costing a million dollars, and it is understood that the city will grant the sum of one million dollars to the Montreal University Hospital. The grant will be made in payments of seventy-five thousand dollars a year and the first instalment will be made as soon as necessary enactments have been passed.

New Brunswick

THE additions and extensive repairs to the Saint John Tuberculosis Hospital are nearing completion. There will still be a waiting list for admission in spite of the increased capacity, indicating that the accommodation for tuberculous patients in the province is still inadequate.

The Annual Report of the Chief Medical Officer, Dr. George G. Melvin, for the year 1929 shows a slight decrease in the death rate from diphtheria, and typhoid fever. Smallpox is practically non-existent and there is a definite decrease in the death rate from tuberculosis. A steady and considerable increase in automobile accidents is reported.

Nova Scotia

SOME of the papers presented at the Joint Meeting of the Medical Society of Nova Scotia and the Nova Scotia Health Officers' Association were "Maternal Mortality" and "Ante and Post Natal Care in Obstetrics" by Dr. W. B. Hendry; "Surgery" by Dr. George D. Stewart, New York; "Bacteriophage" by Dr. R. A. McKeen, Halifax; "Caesarean Section, Case Report" by Dr. D. McNeil, Glace Bay; "Frequent Urination" by Dr. Frank Mack, Halifax; "Cardiac Conditions Simulating the Acute Abdomen" by Dr. G. R. Burns; The Round Table discussion dealt with the following topics: Birth Control, Maternal Mortality, Tuberculosis, Cancer, Is Nova Scotia Over-Hospitalized? The Honourable Dr. G. H. Murphy, Minister of Health, also addressed the gathering.

The Digby General Hospital which was opened for inspection on April 28th was erected at a cost of $45,000. Although a small hospital, it is a model in every respect.

Prince Edward Island

DR. B. C. KEEPING has returned to Charlottetown after extended post-graduate study at the School of Hygiene, University of Toronto, and a visit to several of the State Departments of Health. Dr. Keeping was recently appointed Provincial Medical Officer of Health to succeed Dr. Creelman who will give his entire time to the direction of the Provincial Sanatorium.

Books and Reports

D. T. FRASER, B.A., M.B., D.P.H.; R. R. MCCLENAHAN, B.A., M.B., D.P.H.

Recent Advances in the Study of Rheumatism. *By Frederic John Poynton and Bernard Schlesinger, London, England.. Publishers, The Macmillan Company of Canada, Limited, 70 Bond Street, Toronto,* 1931. *Pages,* 313; *illustrations,* 25. *Price,* $3.75.

"The problem of 'rheumatic diseases' is so formidable that the investigator is met by difficulties on every side. Further, the recent recognition of the serious nature of these diseases has resulted in the development of an extensive literature touching upon the most varied aspects of the subject.

Such a development is a hopeful one, but at the present moment makes a judicial review no light task, for, without exaggeration, there is wide diversity of opinion upon nomenclature, causation, pathology and treatment. We remain convinced from this review that, though the clinician may at present be looked upon as the court jester in the palace of medicine, he is and will always be the stimulator of scientific advance and the best friend of the patient."

This, from the preface, indicates the difficulties under which this book was compiled. Recognizing the difficulties, it would be futile to hope that anyone—even those so well qualified as the authors—could clarify all the problems of rheumatism—let alone solve them. They have done much for those who have not access to a periodical library in bringing together, under a very kindly review, the literature on the subject, pointing out, for the most part, the virtues of the various contributions rather than the failings. Even for those who have ready access to recent periodicals, the references at the end of each chapter are very valuable.

The review is a most complete one including the latest contributions not only in European literature but in American literature as well. Considerable space is devoted to a review of the literature on the "allergic" factor in rheumatism, of the importance of which the authors appear to be convinced. An analogy between the allergic manifestations of rheumatism and tuberculosis is indicated and on page 29 the following sentence occurs, "On the whole there seems to be no convincing evidence as yet that acute rheumatism is infectious." But the authors add a timely word of caution: "In conclusion we would point out the danger of using the term 'allergy' indiscrimately and as a cloak for ignorance. Even those specially skilled in the study of immunology still regard allergy as a problem of much obscurity." The book is up-to-date, too, in reviewing the treatment of rheumatism under which 16 pages are devoted to the use of nirvanol.

Although one might wish for more critical review of the mass of literature which the authors have condensed to these 300 pages, the book serves a very definite purpose in having collected the material together and presenting it in readable form. The reader, however, must separate the chaff from the wheat.

The printing is clear with a noteworthy absence of typographical errors; what illustrations there are, are good.

BOOKS RECEIVED

International Studies on the Relation Between the Private and Official Practice of Medicine with Special Reference to the Prevention of Disease, Conducted for the Milbank Memorial Fund by Sir Arthur Newsholme, Volume II. Publishers, George Allen and Unwin Limited; The Williams & Wilkins Company, Mt. Royal and Guilford Avenues, Baltimore, Maryland, 1931.

Accidental Injuries, by Henry H. Kessler. Publishers, Lea & Febiger, 600 S. Washington Square, Philadelphia, Pa., 1931

A Text-Book of Medical Diseases for Nurses Including Nursing Care, by Arthur A. Stevens and Florence Anna Ambler, Philadelphia. Publishers, W. B. Saunders Company, 1931. Canadian Agents, McAinsh & Co. Limited, 60 Front Street West, Toronto, Ont.

CURRENT HEALTH LITERATURE

These brief abstracts are intended to direct attention to some articles in various journals which have been published during the preceding month. The Secretary of the Editorial Board is pleased to mail any of the journals referred to so that the abstracted article may be read in its entirety. No charge is made for this service. Prompt return (within three days) is requested in order that the journals may be available to other readers.

Public Health Service-A Sound Investment—A succinct presentation of this subject by Dr. Dublin. In speaking of the gain in the average length of life, he says, "These gains are fortunately not mere additions to the period of useless old age, but represent years of activity and production achieved through eliminating much premature death." Dr. Dublin shows by facts and figures the returns from public health expenditures, points out where the expenditure is most needed and will yield the best returns, and compares such expenditures with those for other purposes. Stimulating and instructive, easily read and short, every health officer will find material in this communication of great assistance in his work.

Dublin, Louis I., Am. J. Pub. Health, v. XXI, No. 5 (May), pp. 479-490.

Undulant Fever—The communications listed below present the latest information in regard to the bacteriology, incidence and epidemiology of undulant fever. Huddleson reviews the work on differentiation of strains and shows that the growth behaviour towards aniline dyes in suitable media is the best criterion at present for this purpose. Norton and Pless outline procedures necessary in regard to abortus infection for the control of certified milk. Most authorities of to-day would prefer pasteurization to the procedures outlined, or would require it as a necessary supplement. Hasseltine, in a study of the epidemiology, divides cases into three groups, —the milk group, the meat group and the farm group. He presents strong evidence of the fact that infection can exist without disease, and makes a plea for careful collection of more information in regard to the disease in man and lower animals.

Huddleson, F.; Norton, J. F. and Pless, L. R.; Meyer, K. F.; Hasley, D. E.; Hasseltine, H. E.; Am. J. Pub. Health, v. XXI, No. 5 (May), pp. 491-525.

Bacteriophagy and Recovery from Infectious Disease—An address on the subject of bacteriophage by Dr. d'Herelle. Like all Dr. d'Herelle's writing, it is interesting and stimulating, sometimes irritating, not always convincing.

d'Herelle, F., Canad. M. J., v. XXIV, No. 5 (May), pp. 619-628.

A Case of Leprosy in Canada—The disease was apparently contracted while on active service in France. The patient was discharged in 1919. No diagnosis was made at that time although "limitation of movement, distal joint, left hand" was noted. Since then the patient has carried on as a printer. On diagnosis he was removed to the leprosorium at Tracadie, N.B., for treatment.

Usher, B., Canad. M. J., v. XXIV, No. 5 (May), pp. 693-694.

The Collection and Disposal of House Refuse—This paper was written from a very practical standpoint and compares the cost of collec-

tion by different types of vehicles. The tractor with the trailer gave the lowest cost per ton collected. The disposal of the garbage is likewise given in detail and the amount to be saved by salvaging is shown. This paper will well repay reading by anyone responsible for this phase of administration.

Baggott, S. C., J. Roy. San. Inst., v. LI, No. 11 (May), pp. 586-593.

Income from Medical Practice—This enquiry in regard to income goes back to the time of the early Arab physicians in the 7th century A.D. The present estimates are based on 65,000 replies of physicians in the United States. Orthopaedic surgery appears to be the most lucrative special practice. The lowest average was found in public health work. As the gross income, however, was used as the basis for consideration, the comparison is, to that extent, not a fair one. Twenty-five per cent of the physicians reported an income of less than $3,500.00. The estimated average net income of $5,250 is based on the average gross income of $7,781.

Leland, R. G., J.A.M.A., v. 96, No. 20, (May 16), pp. 1683-1691.

The Aetiology of Disseminate Sclerosis: Some Criticisms of Recent Work, Especially with Regard to the "Spherula Insularis"—The author reports an attempt to repeat the work of Miss Chevassut under strictly controlled conditions. His conclusion is as follows: "These experiments fail to substantiate the work from the Westminster Hospital claiming the presence of a virus, so-called 'spherula insularis', in cultures of cerebrospinal fluid from cases of disseminate sclerosis." Sir James Purves-Stewart and Miss Chevassut discuss Dr. Carmichael's contribution and do not accept his findings.

Carmichael, E. A., Proc. Roy. Soc. Med. v. XXIV, No. 5 (Mar.). pp. 591-606.

Syphilis and Gonorrhoea as Causes of Blindness — Approximately 15 per cent of all blindness in America is due to syphilis and probably an additional 4 per cent is due to ophthalmia neontaorium.

Royer, B. Franklin. J. Social Hygiene, v. XVII, No. 3 (March), pp. 151-157.

Birth Records of Illegitimates and of Adopted Children—The following resolutions were adopted by the Vital Statistics Section of the American Public Health Association: Resolved that in the opinion of this Section, methods should be devised and made legally effective for the correction of birth records of children legitamized, and of adopted children, and also for the registration of foundlings; and be it further resolved that a committee of five be appointed by the chair to consider and report, at the next Annual Meeting of this Section, the advisability of a uniform or "standard" system for:

1. Acts correcting birth records of illegitimate children subsequently legitimatized.
2. Acts regulating birth records of children legally adopted.
3. Acts for the making of birth records of foundlings.

Howard, S. L. (Pt. I) and Hemenway, H. B. (Pt. II), Am. J. Pub. Health, v. XXI, No. 6 (June), pp. 641-647.